



## Mapping SNOMED-CT to ICPC-3: report

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## 1. Executive Summary

### Why this matters

Primary care is the foundation of health systems. It deals with first contact, uncertainty, multimorbidity, and long-term relationships with patients. Digital health strategies increasingly rely on **SNOMED CT** as a reference clinical terminology to support semantic interoperability across care settings. However, SNOMED CT alone does not provide the organisational structure needed to reflect how primary care is delivered, followed over time, and analysed at population level.

The **International Classification of Primary Care (ICPC-3)** was specifically designed for this purpose. Without a systematic link between SNOMED CT and ICPC-3, the transition to SNOMED CT risks increasing complexity for clinicians while reducing the usability of primary care data for planning, quality improvement, and policy.

### Objectives

The primary objective of this project was to develop and validate a systematic mapping from SNOMED CT to ICPC-3 that preserves the core principles of primary care while enabling semantic interoperability. Specifically, the project aimed to:

- explore and compare complementary mapping methodologies;
- assess the feasibility and effort required to establish high-quality mappings;
- generate validated mapping outputs suitable for use in primary care information systems; and
- contribute to the broader SNOClass initiative mapping SNOMED CT to multiple WHO-FIC classifications.

### Study Design and Methods (High-Level)

This work was conducted as part of the Belgian SNOClass project, initiated by Ghent University at the request of the Belgian SNOMED CT National Release Centre. The ICPC team applied and evaluated four complementary mapping strategies:

1. **Conversion-based mapping** using existing links between the Belgian Bilingual Biclassified Thesaurus (3BT), SNOMED CT, and ICPC-2, extended to ICPC-3 via a reverse conversion table.
2. **Automated lexical matching**, employing a Python Whoosh–based search engine to generate candidate mappings between SNOMED CT concepts and ICPC-3 classes.
3. **Manual hierarchy-based semantic mapping**, involving expert analysis of SNOMED CT and ICPC-3 hierarchies to establish high-confidence matches and a reference “gold standard”.

4. **Mapping concepts through a fictional use case**, collaboratively creating a clinically relevant fictional use case and identifying all lexical entries important for medical record-keeping.

Mappings were qualified using predicates aligned with the Simple Standard for Sharing Ontological Mappings (SSSOM), including exact, broad, narrow, close, partial, and no-match relationships. Human expert validation was an integral component of all approaches.

### **Key Findings**

- Mapping SNOMED CT to ICPC-3 is conceptually feasible but methodologically complex due to differences in granularity and purpose between a reference terminology and a domain-specific classification.
- Conversion-based mapping leveraging legacy 3BT resources provided a pragmatic starting point, covering approximately one-fifth of ICPC-3 classes, but still requires substantial manual validation.
- Automated lexical approaches efficiently generated large volumes of candidate mappings, suitable for prioritisation and expert review, but are insufficient on their own to provide a complete map.
- Hierarchy-based semantic mapping yielded high-quality results and extensive coverage through narrow-to-broad relationships, but was labour-intensive, averaging approximately 30 minutes of expert time per concept.
- Use case generated concepts were collected and will be used to test the validity of the maps in an openEHR platform.
- Exact one-to-one matches between SNOMED CT and ICPC-3 were relatively rare; most valid mappings reflected broader or narrower semantic relationships.

### **Interpretation**

The findings confirm that no single mapping strategy is sufficient in isolation. High-quality mapping requires a combination of automated techniques for scalability and expert-driven semantic analysis for clinical validity. The predominance of narrow-to-broad matches reflects the intentional abstraction of ICPC-3 compared with the fine granularity of SNOMED CT, showcasing their complementary roles, instead of being conceptually redundant.

### **Implications**

For primary care, the results highlight that adopting SNOMED CT as a reference terminology does not eliminate the need for ICPC-3. On the contrary, systematic mapping is essential to preserve longitudinal, person-centred care while enabling interoperability, data aggregation, and secondary use. At an organisational and policy level, failure to integrate these systems risks undermining the usability and interpretability of primary care data during the transition away from legacy solutions such as 3BT.

## Lessons Learned

- Continue development toward a comprehensive, validated SNOMED CT–to–ICPC-3 map through coordinated international collaboration.
- Combine automated lexical tools with structured expert validation workflows to optimise efficiency and quality.
- Establish governance mechanisms for maintenance and updating of mappings in line with SNOMED CT and ICPC-3 releases.

## Conclusion

This project demonstrates that semantic interoperability and primary care relevance are not competing goals. By mapping SNOMED CT to ICPC-3, health systems can modernise digital infrastructures while safeguarding person-centred, longitudinal primary care, which is an essential condition for effective policy, planning, and population health management.

## 2. Introduction

The increasing digitalization of health care has intensified the need for clinical information to be recorded in a way that is both semantically precise and contextually meaningful. Nowhere is this challenge more evident than in primary care. Primary care is characterized by first-contact access, a high degree of uncertainty, multimorbidity, longitudinal relationships, and a continuous accumulation of knowledge about the person over time. Information systems that support this domain must therefore do more than capture diseases and interventions: they must support the understanding of health problems as they emerge, evolve, and interact within a person's life context.

Over the past decades, SNOMED CT has emerged as the most comprehensive international clinical reference terminology. Its concept-based architecture enables detailed, unambiguous representation of clinical meaning and supports semantic interoperability across health care domains. SNOMED CT is indispensable for precise clinical documentation, secondary use of data, and cross-domain information exchange. However, SNOMED CT is a nomenclature, not a classification. It is designed to represent clinical reality in fine detail, not to organize care according to the logic of a specific clinical domain.

Primary care requires such an organising logic. The International Classification of Primary Care (ICPC) was explicitly developed to reflect the way care is delivered and understood by frontline clinicians. It structures information around reasons for encounter, evolving problem definitions, episodes of care, and longitudinal morbidity patterns. ICPC supports the registration of uncertainty, early presentations, and non-disease-oriented health problems, making it fundamentally different from specialist-oriented classifications. This structure is essential to

support person-centred care, where meaning is accumulated over time and across patient encounters rather than confined to isolated episodes (Schrans, 2018).

Using SNOMED CT alone in primary care risks overwhelming clinicians with excessive granularity while obscuring what is clinically relevant at the level of the person and the practice population. Conversely, using ICPC without a robust underlying reference terminology limits semantic precision and interoperability beyond the primary care domain. This tension reflects a long-recognized distinction in general practice: coding serves the accurate representation of individual clinical meaning, while classification serves aggregation, comparison, continuity, and learning at the level of care delivery and populations.

The development of ICPC-3 offers a unique opportunity to reconcile these complementary needs. Mapping SNOMED CT to ICPC-3 is not merely a technical interoperability exercise; it is a conceptual necessity to ensure that rich clinical data can be meaningfully organized according to the epistemology of primary care. Such a mapping enables clinicians to document care using precise, internationally interoperable concepts while preserving the primary care perspective that emphasizes longitudinal understanding, contextual relevance, and person-focused continuity.

Moreover, primary care increasingly depends on information sharing across settings, disciplines, and with patients themselves. Without a structured link between SNOMED CT and ICPC-3, primary care data risk being either semantically isolated or conceptually misaligned with the realities of frontline care. Mapping provides the bridge. SNOMED CT functions as the reference terminology that guarantees semantic consistency, while ICPC-3 functions as the domain-specific classification that preserves clinical relevance, usability, and meaning over time.

This project therefore starts to address a critical gap in current health information infrastructures. By developing and validating a systematic mapping from SNOMED CT to ICPC-3, it aims to support semantic interoperability without sacrificing the core principles of primary care. Ultimately, this work contributes to information systems that do not merely record encounters or diseases, but that help capture and support care provided by health professionals to their patients.

### **Why Primary Care Requires Both a Nomenclature and a Classification**

Primary care information systems must support two fundamentally different, yet complementary, functions:

1. the precise representation of clinical meaning at the point of care, and
2. the structured organisation of care over time, across patients and populations.

These functions cannot be fulfilled by a single terminological approach. They require the deliberate combination of a clinical nomenclature and a domain-specific classification.

### **From 3BT to a SNOMED CT–based GP Reference Set**

In Belgium, the Belgian Bilingual Biclassified Thesaurus (3BT) has historically fulfilled this bridging role for general practitioners between nomenclature and classification. It enabled GPs to document clinical information using familiar clinical labels while encoding these data in the background with ICPC and International Classification of Diseases (ICD) codes. In practice, 3BT acted as a pragmatic, end-user-oriented interface between clinical language and classification, tailored to the needs of primary care.

However, 3BT is increasingly reaching its limits. It is tightly coupled to legacy classifications, offers limited semantic expressiveness, and does not align with contemporary requirements for semantic interoperability, cross-domain data exchange, and reuse of clinical data in broader digital health ecosystems. As a result, 3BT is being phased out and replaced by a GP Reference Set (GP Refset) based on SNOMED CT as the underlying reference terminology.

This transition marks a fundamental shift from a primarily classification-driven encoding strategy to a terminology-driven semantic foundation.

### The Role of SNOMED CT as Reference Nomenclature

SNOMED CT provides a comprehensive, concept-based nomenclature that allows clinicians to record clinical meaning with high precision. It supports synonyms, multilingualism, post-coordination, and formal semantic relationships, making it ideally suited as a reference terminology for modern electronic health records.

For primary care, the introduction of a SNOMED CT-based GP Refset offers clear advantages:

- richer and more accurate clinical representation;
- improved semantic interoperability with other care domains;
- better support for data reuse, decision support, and analytics;
- alignment with international standards and infrastructures.

However, SNOMED CT is **not designed to organise care**. As a nomenclature, it answers the question *“What exactly do we mean?”*, but not *“How should this information be grouped, followed, compared, or interpreted within a specific clinical domain?”*

Relying on SNOMED CT alone would therefore place an unrealistic burden on primary care clinicians and systems and lead to various issues including:

- excessive granularity at the point of care,
- loss of overview and longitudinal coherence,
- difficulty in aggregating data for morbidity registration, quality improvement, and policy,
- a mismatch with the way GPs reason clinically, work, and provide care.

### Why a Primary Care Classification Remains Essential

This is where **ICPC-3** plays a critical and irreplaceable role.

Primary care differs fundamentally from specialist care. It is characterized by:

- first-contact care and undifferentiated presentations,
- frequent uncertainty and evolving problem definitions,
- multimorbidity rather than single-disease focus,
- and long-term relationships with persons rather than isolated episodes.

ICPC was explicitly designed to reflect this reality. It provides a classification logic that:

- starts from the reason for encounter,
- supports symptom-based and provisional problem definitions,
- structures care into episodes that evolve over time,
- enables longitudinal morbidity analysis at patient- and population level.

A classification like ICPC-3 does not aim to capture every clinical nuance. Instead, it deliberately **reduces complexity** in a meaningful way, allowing information to be:

- comparable across patients and practices,
- analysable for epidemiology and quality improvement,
- usable for care organisation, planning, and research.

This reduction is not a weakness; it is a functional necessity of primary care.

### Complementarity

The transition to a SNOMED CT-based GP Refset therefore does not eliminate the need for ICPC-3. On the contrary, it makes the need for a well-defined, domain-specific classification even more compelling.

In this architecture:

- SNOMED CT functions as the semantic backbone, ensuring precise, interoperable representation of clinical meaning.
- ICPC-3 functions as the organising framework for primary care, preserving its epistemology, workflow, and longitudinal perspective.

Mapping SNOMED CT to ICPC-3 enables:

- clinicians to document care using rich, clinically meaningful concepts,
- systems to classify and aggregate these data in a way that reflects primary care practice,
- continuity between individual care and population-level insights,
- and interoperability with other domains without sacrificing primary care relevance.

## Future Implications

The replacement of 3BT by a SNOMED CT–based GP Reference Set marks a major shift in how clinical data are registered in general practice. While SNOMED CT provides a powerful and interoperable reference terminology, it cannot on its own fulfil the organisational and longitudinal information needs of primary care.

As the GP Refset becomes the primary reference for clinical registration in general practice, it cannot exist in isolation from the classifications that give meaning to primary care data. Relevant classifications for the primary care domain—most notably ICPC-3—must be explicitly integrated.

This integration cannot be ad hoc. It requires a systematic, transparent, and clinically validated mapping between SNOMED CT concepts and ICPC-3 classes. Without such a mapping:

- primary care risks losing its domain-specific structure;
- longitudinal, person-focused care becomes harder to support digitally;
- and the replacement of 3BT would represent a regression rather than a progression for general practice.

This project therefore addresses a foundational requirement of the transition to SNOMED CT in primary care: ensuring that semantic richness and domain relevance evolve together. By mapping SNOMED CT to ICPC-3, the project safeguards the ability of primary care information systems not only to record data, but to support care for people over time.

## Project aim

ICPC-3 remains essential to support reasons for encounter, evolving problem definitions, episodes of care, and morbidity registration in the first line. Without an explicit mapping between SNOMED CT and ICPC-3, the transition away from 3BT risks increasing complexity for clinicians while reducing the usability of data for care organisation, quality improvement, and policy.

This project therefore aims to address this risk by developing a systematic mapping from SNOMED CT to ICPC-3. In doing so, it ensures that semantic interoperability and primary care relevance evolve together, safeguarding person-centred, longitudinal care within a modern digital health infrastructure.

## A Belgian Project for mapping SNOMED CT to three medical classifications: the SNOClass project

To respond to this challenge, the SNOClass project was initiated by Ghent University at the request of the Belgian Terminology Centre, SCT National Release Centre in early 2025. It consists of three teams and a central coordination. Each of the teams focuses on mapping SNOMED CT

to one of the following classifications: the International Classification of Functioning (ICF), the International Classification of Hospital Interventions (ICHI) and the International Classification of Primary Care (ICPC). This report focuses on describing the work that has been undertaken by the ICPC team.

The three teams worked independently but were supported by a central coordinator and an ICT and web semantics specialist. The teams joined biweekly to discuss their progress, the challenges faced, and to give each other feedback. Additionally, the teams convened with an independent Steering Committee on three occasions during the 12-month project.

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### 3. Terminologies Overview

#### 3.1. SNOMED CT

SNOMED CT (Systematized Nomenclature of Medicine – Clinical Terms) is a global, multilingual clinical terminology that standardises the way diseases, symptoms, procedures and medications are coded and exchanged within electronic health records (EHRs). With more than 370 000 clinical concepts in its monthly updated International Edition, the system is mapped to major international standards such as ICD9CM, ICD10, LOINC and OPCS4, enabling seamless interoperability across healthcare providers and improving data quality. The terminology is maintained by SNOMED International and can be explored through its online browser (<https://browser.ihtsdotools.org/>).

In Belgium, the Terminology Centre of the Federal Public Service Health acts as the national release centre, distributing and managing SNOMED CT while producing Dutch and French translations. Since its first release in March 2018, the Belgian language reference set has grown in November 2025 to 646,382 Dutch, 409,344 French and 55,258 German validated translations, with 17,831 Dutch and 15,871 French active GP terms in the General Practitioner (GP) language reference sets. Monthly releases ensure the terminology remains current. SNOMED CT's comprehensive, scientifically validated vocabulary reduces ambiguity, minimizes errors, and supports clinical decision making, data analytics, research, and public health monitoring across diverse EHR systems.

#### 3.2. ICPC-3: Classification for Primary Care

The **International Classification of Primary Care, Third Revision (ICPC-3)** is the latest version of the global standard for systematically capturing and organising clinical information in primary care settings. It was developed under the auspices of **WONCA's ICPC-3 Foundation** to meet the unique needs of general practice and other first-line care providers (WONCA, n.d.).

ICPC-3 is an international **domain-specific classification** tailored to the reality of primary care. It provides a framework for coding:

- the **reason(s) for encounter** as presented by the patient,
- **health problems and diagnoses** encountered in first-line care,
- **functioning, participation, and contextual factors**, and
- **processes of care** such as interventions and management (HL7 International, n.d.).

This single classification captures not only diagnoses, but also *symptoms, complaints, functioning, and care processes* — elements that are common in primary care but often not represented together in traditional disease-oriented systems(WONCA, n.d.).

Further details about how the ICPC-3 classification is constructed are summarised in the brochure (see Annex 1)

## The importance of ICPC-3 for Primary Care Worldwide

### 1. Designed for the essence of Primary Care

Primary care is distinguished by:

- *undifferentiated presentations,*
- *ongoing, longitudinal care,*
- *multimorbidity, and*
- *reason-for-encounter–based decision making.*

ICPC-3 reflects this clinical logic by structuring data around what patients bring when they seek medical care and how problems evolve over time (van Boven & Napel, 2021).

### 2. Person-Centred and Contextual

Unlike many specialist or hospital-focused classifications, ICPC-3 includes elements beyond diagnoses, such as functioning-related factors, environmental and personal factors, supporting a more **holistic, person-centred approach** to health (WONCA, n.d.).

### 3. International Standard for Comparison and Research

ICPC-3 provides a **common language** for primary care encounters across countries and health systems, enabling:

- comparability of morbidity and care patterns,
- population-level analysis,
- research on utilization and outcomes,
- informed health policy and planning (WONCA, n.d.).

### 4. Interoperability with Other Standards

ICPC-3 is linked conceptually and structurally with other international standards (e.g., ICD10/11, ICF, SNOMED CT), making it useful in electronic health records and for data exchange while preserving the domain-specific perspective of primary care.

## 4. Mapping Methodology

### 4.1. General Principles for qualifying matches

Before establishing mapping strategies from SNOMED CT to ICPC-3, two essential steps were necessary. The first was to come up with a set of conceptually validated definitions for how the concepts in each of the systems relate to each other. This was done after reviewing the literature and it is described below. The second was to find a valid subset of concepts within SNOMED CT which could aid in focusing the mapping efforts and increasing efficiency. For ICPC we were looking for a subset that would be representative of the field of primary care. In Belgium, such a work had already been done during a previous 3BT to SCT project. This will be described in **Section 4.2.1**.

Following the Simple Standard for Sharing Ontological Mappings (SSSOM) specifications (Matentzoglou et al., 2022), mappings are a list of semantic triples: subject (from SNOMED CT) – predicate (match qualifier) – object (from ICPC-3).

Predicate values selection is left open to mapping creators, with recommended values. Within SNOClass we selected six values.

Four predicates recommended by SSSOM:

- skos:exactMatch - The subject and the object can, with a high degree of confidence, be used interchangeably across a wide range of information retrieval applications.
- skos:narrowMatch - The object of the triple is a narrower concept than the subject of the triple.
- skos:broadMatch - The object of the triple is a broader concept than the subject of the triple.
- skos:closeMatch - The subject and the object are sufficiently similar that they can be used interchangeably in some information retrieval applications.

And two additional predicates created for the SNOClass:

- snoclass:noMatch – The subject of the triple has not a match to the object.
- snoclass:partialMatch – The object and the subject of the triple overlap but the match cannot be characterized by narrow, broad, close or exact.

SNOMED CT Mapping guide uses similar qualifiers (SNOMED International, n.d.-a):

- Equivalent - The definitions of the concepts mean the same thing (including when structural implications of meaning are considered) (i.e. extensionally identical).
- Broader - The target mapping concept is broader in meaning than the source concept.

- Narrower - The target mapping concept is narrower in meaning than the source concept.
- Inexact - The target mapping concept overlaps with the source concept, but both source and target concepts cover additional meaning, or the definitions are imprecise, and it is uncertain whether they have the same boundaries to their meaning.
- No match/unmatched - There is no match for this concept in the target code system.

Notes:

- 1- skos:closeMatch equivalent qualifier is missing in SNOMED CT, but according to SKOS definition “Equivalent” can be used to follow SNOMED CT mapping guide.
- 2- snoclass:partialMatch is more specific than SNOMED CT “Inexact” qualifier, the latter can be used to follow SNOMED CT mapping guide.
- 3- snoclass:noMatch scope is to qualify a candidate match, for example coming from the SNOClass Whoosh-based search engine. If the candidate is not validated, a snoclass:noMatch can be used. Whereas SNOMED CT “noMatch/unmatched” means that no match was found in the entire target source.

## 4.2. Exploration of methodological approaches

Considering that the nature of this work is on uncharted terrain, we have sought to explore different methodologies to generate high quality mapping between SNOMED CT and ICPC-3. For each of the methodologies we have chosen an appropriate sample or sub-sample of SCT concepts.

Three different mapping strategies were developed in our project:

- i. Updating the 3BT connections: conversion-based mapping,
- ii. String search bulk approach: Lexical Search Engine,
- iii. Hierarchy semantic mapping approach, and
- iv. Identifying the concepts of the use case “low back pain”

### 4.2.1. Updating the 3BT connections: conversion-based mapping

#### Proposed sample of 3BT connections: The Belgian 3BT to SCT Project and the Belgian GP subset

The Belgian Bilingual Biclassified Terminology (3BT) is a medical dictionary consisting of 50.000 coupled Dutch and French clinical terms linked to a dyad of ICPC-2 and ICD-10 codes and a single IBUI code. It was developed more than 20 years ago (De Jonghe et al., 2006; Jamouille et al., 2000), following up on a pan-European assessment of data collection for health monitoring in

primary care (Lagasse et al., 2001). This dataset consisted of lexical entries from medical records used to define medical problems and reasons for encounter (RFE), therefore referring mostly to symptoms and diagnoses. There are 50.000 Pairs of Dutch and French labels, identified by a single code (IBUI) and coded to both ICPC2 and ICD10. This resource is built in each of the 7 certified platform systems for primary care electronic health records in Belgium, s and has provided the basis for more than two decades of continuous epidemiological surveys of primary care.

During the year 2022 and 2023, a joint effort was made to match these IBUIs to SNOMED CT terms. This was successfully achieved for 5.431 IBUIs linked to 4160 SCT terms. This was the basis for the construction of the GP subset of the Belgian SNOMED CT edition, with the Dutch/French language reference set (RefSet), on which we focused our work. It has since then been expanded to over 12.000 concepts, covering terms from the International Patient Summary and terms related to disability information.

For the purposes of the current project, we worked with the 4.160 SCT concepts of the previous IBUI-SCT project with each concept linked to the originating lexical entries in Dutch and French and its IBUI, and the link to the ICPC-2 and ICD-10 code and label.

### Preparing the mapping to ICPC-3

Based on an existing conversion table from ICPC-3 to ICPC-2 and ICPC-1(van Boven & Napel, 2021), our team generated a reverse conversion table from ICPC-2 to ICPC-3 and applied it to this subset. This created a set of ICPC-3 candidates to the 4.160 SCT concepts present in the subset. The number of candidates per concept varied from 1 to 10. This conversion table provided the initial sample of concepts for this project.

## ICPC-3 source set - The Belgian Bilingual Biclassified Thesaurus (3BT)

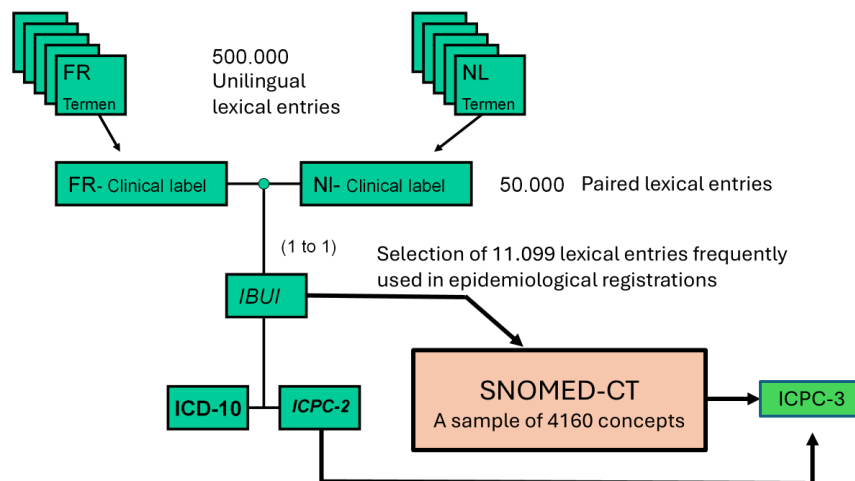


Figure 1: The Belgian Bilingual Biclassified Thesaurus (3BT)

We selected within the subset, concepts that had only one ICPC-3 code as candidate for a match, retrieving 1.780 lexical entries, 1.338 SNOMED CT concepts and 342 ICPC-3 classes. This represents a coverage of 32% of the 3BT subset of SNOMED CT and 20% of all ICPC-3 classes. We prepared a sample of 50 of these matches for human validation.

#### Human validation

A first analysis of this sample revealed that human validation is needed even when only one ICPC3 candidate is listed. The validation is a manual task, with a complex comparison of the hierarchies of both terminological resources. It generates considerable amounts of narrow to broad matches among the children of the matched SCT concept. We estimate that the average time consumption is 30 minutes per concept, meaning that this is a laborious approach, which gives opportunity for a future collaborative international effort to complete this endeavour. Based on our first analysis, our findings suggest the great majority will be narrow-to-broad matches, and approximately 5% will be exact matches.

### 4.2.2 The string search bulk approach: Lexical Search Engine

#### Using Python Whoosh as a Lexical Search Engine

The second mapping strategy used in our project was a string search bulk approach using Whoosh(Chaput, 2012). Whoosh is an open-source Python library for creating search engines, well-tailored for SNOClass. Whoosh may compare unfavourably to LLM techniques for mapping but is faster (Bilgis, 2024). The latter was an important choice factor to be able to provide initial candidate mappings to work with and evaluate. This has been applied first to ICHI, then to ICF, finally to ICPC-3.

In this approach, the **source** is SNOMED CT and the **target** is ICPC-3. The **target** is *indexed* in a format optimized for text search. Words that form ICPC-3 *preferred terms* are transformed through stemming, replacing characters with accents with characters without accents, removing stop-words and normalizing words. This method is then more likely to match with candidate labels coming from the *source* (SNOMED CT Fully Specified Name and synonyms). In addition to source and target items, ICPC-3 *index* also includes: ICPC-3 identifier, synonyms, index terms, and links to other classifications.

The Search Engine is then applied automatically to the list of SNOMED CT concepts, using FSN and synonyms as *queries*. For each the Search Engine uses a BM25F algorithm (Robertson et al., 2004) to score similarity between the *query* and the ICPC-3 index created earlier, considering some context elements (e.g. FSN length, Index size). For each successful match, the score and context (which words correspond) are retained and stored in spreadsheet for expert evaluation.

We used two variants of the Search Engine to yield mapping candidates (Cheng et al., 2022):

1. AND: all words from the SNOMED CT term (or synonyms) are searched in the ICPC-3 index
2. OR: a maximum number of words from the SNOMED CT term (or synonym) are searched in the ICPC-3 index.

### Choosing the sample for the string search bulk approach

Using the 27,710 preferred term and synonyms extracted for 12,273 SCT concepts of the Belgian GP subset (release date: 2025-11-15) as the *source* and the ICPC-3 preferred term as the *target*, we applied an automated search engine based on Python Whoosh to collect mapping candidates.

### 4.2.3 Hierarchy semantic matching approach

While working on mapping concepts from SNOMED CT to ICPC-3 through the conversion table, we noticed the complexity of relating these two systems. Therefore, we decided to take on the task of manually evaluating those relationships on top of generating automated maps. This third mapping strategy would be intended to:

- a) develop a “*gold standard*” for mapping, to which the automated maps could be compared;
- b) gauge the size of such a task; and
- c) establish standardized steps for a semantic matching approach.

Starting from one ICPC-3 class for which there is an exact match with a SCT code, we then move up and down the SCT hierarchy to map the adjacent concepts. In this semantic approach, we carefully read the ICPC-3 class entry within the ICPC-3 browser, exploring inclusions and exclusions, search terms and suggested SNOMED CT mappings. In parallel, we also explore the SNOMED CT browser, reading the metadata, children and parents. This method attempted to find the best possible match between ICPC-3 and SNOMED CT, taking into consideration the higher aggregation level of ICPC-3 and the higher granularity of SNOMED CT. Once the best possible match in SCT is identified, we analyse whether the children can be matched to ICPC-3 as broad matches. This approach therefore yielded many mapped concepts, with a high degree of certainty and increased coverage of the terminology. Nonetheless it takes painstaking effort, and a large amount of time and human resources are needed to complete such a task. completed.

#### Example: Post-traumatic stress disorder

From the 3BT conversion table, **we selected a SNOMED CT concept with only one ICPC-3 candidate class**. The **first step** is to examine the ICPC-3 browser for the full description of the class, the list of inclusions and exclusions, the coding hints, search terms and the suggested SNOMED CT concept(s). **Table 1** is an excerpt from the ICPC-3 class PD09 Post-traumatic stress disorder.

## PD09 Post traumatic stress disorder

### Description

A stressful event followed by a major state of distress and disturbance, with a delayed or protracted reaction, flashbacks, nightmares, emotional blunting and anhedonia interfering with social functioning and performance, and including depressed mood, anxiety, worry and feeling unable to cope, persistent over time.

Complex post-traumatic stress disorder (Complex PTSD) is a disorder that may develop following exposure to an event or series of events of an extremely threatening or horrific nature, most commonly prolonged or repetitive events from which escape is difficult or impossible (e.g., torture, slavery, genocide campaigns, prolonged domestic violence, repeated childhood sexual or physical abuse). All diagnostic requirements for PTSD are met.

In addition, Complex PTSD is characterised by severe and persistent: problems in affect regulation; beliefs about oneself as diminished, defeated or worthless, accompanied by feelings of shame, guilt or failure related to the traumatic event; and difficulties in sustaining relationships and in feeling close to others. These symptoms cause significant impairment in personal, family, social, educational, occupational or other important areas of functioning.

### Inclusion

complex post-traumatic stress syndrome

### Coding hint

feeling anxious PS01; acute stress reaction PS02; feeling depressed PS03; enduring personality change after catastrophic experience PD15

For coding the problem level, consider Sleep functions 2F72

### Search terms

PTSD

PTSS

### ICPC-1

P02

### ICPC-2

P82

### ICPC-1NL

P02.01

### ICD10

Post-traumatic stress disorder F43.1

### ICD11

Post traumatic stress disorder 6B40

### SNOMED CT

posttraumatic stress disorder 47505003

Figure 2. ICPC-3 browser entry for PD09 Post-traumatic stress disorder

The second step is to explore parents and children of the target concept in the SNOMED CT browser. The goal is to confirm which SCT concept will be an exact match or the best possible match to the ICPC-3 class. Once the exact match is confirmed, the next step is to check whether the children of this concept can also be mapped as broad matches to the ICPC-3 class or if they are to be flagged as not belonging to this class (and if so, if there is a hint as to which class this concept is to be mapped). This can be done in two different ways: either the children of the SNOMED CT target concept are exact matches to concepts mentioned in the ICPC-3 browser entry (description, inclusions, search term, SNOMED CT suggestions, etc.) or the coders working on the hierarchy match recognize this term as conceptually belonging to the ICPC-3 class. This may happen frequently, since the inclusions, search terms, etc. in the ICPC-3 browser are meant

as examples of what belongs in that class and not as an exhaustive list of concepts. **Figure 3 (below)** is an excerpt from the SNOMED CT browser exploration of parents and children of the concept 39093002 Post-traumatic stress disorder (disorder).

**Parents**

- > Anxiety disorder (disorder)
- > Post-trauma response (finding)

**Post-traumatic stress disorder (disorder)** ☆

SCTID: 47505003

47505003 | Post-traumatic stress disorder (disorder) |

- en Post-traumatic stress disorder (disorder)
- en Post-traumatic stress disorder
- en PTSD - post-traumatic stress disorder
- en Post traumatic stress disorder
- en Post-traumatic stress syndrome
- en Posttraumatic stress disorder
- en Traumatic neurosis
- fr trouble de stress posttraumatique
- fr syndrome de stress posttraumatique
- nl posttraumatische stressstoornis

Interprets → Emotion

Interprets → Adaptation behavior

After → Traumatic event

**Children (4)**

- Acute post-trauma stress state (disorder)
  - Acute post-traumatic stress disorder following military combat (disorder)
- Chronic post-traumatic stress disorder (disorder)
  - Chronic post-traumatic stress disorder following military combat (disorder)
- Complex post-traumatic stress disorder (disorder)
- Delayed onset post-traumatic stress disorder (disorder)
  - Delayed onset post-traumatic stress disorder following military combat (disorder)

**Figure 2: Exploration of parents and children of the concept Post-traumatic stress disorder (disorder) in the SNOMED CT browser**

In this analysis, the parents are not a better match than the target concept itself. One of the parents (Anxiety disorder) is related to a different ICPC-3 code and the other (Post-trauma response) is broader than any ICPC-3 class. Both these observations are important for the continuation of the work and should be recorded. The concept has 4 children and 3 grandchildren. One of the children is an exact match to an inclusion term (Complex post-traumatic stress disorder). The others are all conceptually belonging the ICPC-3 class. They are all mapped as narrow-to-broad matches to the class PD09.

This short exercise yielded 1 exact match to a ICPC class, 1 exact match to an inclusion term of that class, and 7 narrow-to-broad matches to that class (Figure 4).

### Post-traumatic stress disorder (disorder) direct mapping from SCT to ICPC-3

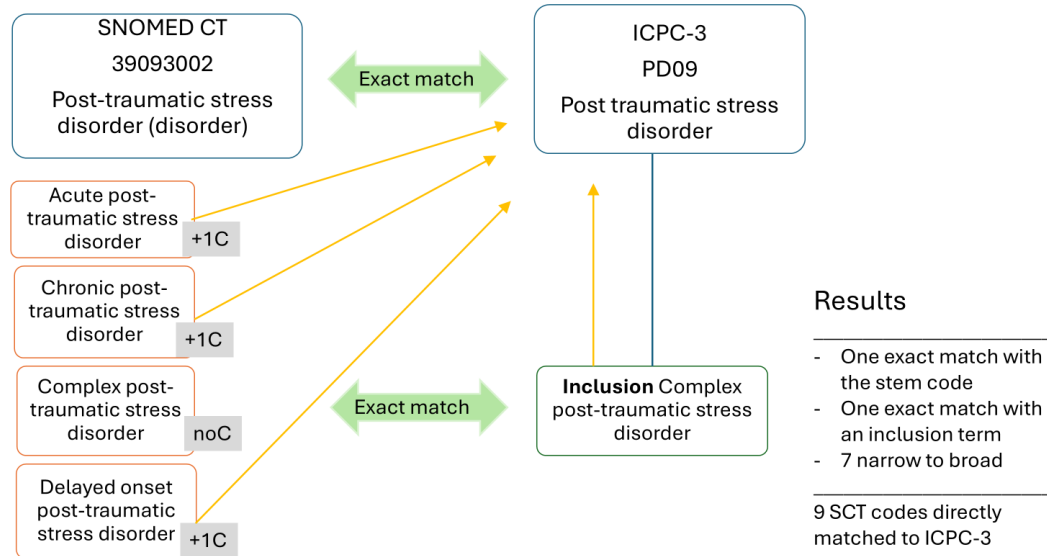


Figure 3 Direct mapping from SNOMED CT to ICPC-3 for Post-traumatic stress disorder

Concepts with more children potentially result in a larger number of narrow-to-broad matches. This approach was also applied to the concepts of Anxiety (finding), Anxiety disorder (disorder), Acute stress disorder (disorder), Finding of back (finding) and Low back pain (finding), resulting in 179 matches. Further reading on the notes from the hierarchy matching approach can be found on **Annex 4**.

#### 4.2.4 Identifying the concepts of the use case “low back pain”

Our team was tasked with the development of a use-case to validate the mapping of SNOMED CT to the three classifications (ICHI, ICF, ICPC) in this project. We decided to build one shared use-case that could connect to the three classifications’ domains. The topic low-back pain was chosen due to its relevance to the domains of all three classifications in the project (primary care, functionality and medical interventions). It is also one of the 200 essential educational objectives for vocational training of general practitioners and has been used to exemplify the usage of ICPC and demonstrate the concept of Episode of Care (Napel et al., 2022).

A fictional account was created of four encounters between a patient and a GP (general practitioner) within an episode of care for “low back pain”.

In the first encounter, the patient is managed with simple analgesics and light exercises; in the second, the pain aggravates and the patient is referred to a specialist; in the third, the patient comes back to the GP to discuss options, after the specialist appointment with a referral to surgical intervention, and in the fourth the patient has a post-operative evaluation. For the full narrative (see **Appendix D, Use-Case: Low Back Pain**). We asked the broader SNOClass team to review our narrative and add more relevant information.

## 5. Mapping Tools and Environment

SNOMED CT editions, International and Belgian, use SNOMED CT Release format version 2 (RF2) for their releases (a tabular formatted text file where columns with headers are separated by tabulations) (SNOMED International, n.d.).

id	effectiveTime	active	moduleId	conceptId	languageCode	typeId	term	caseSignificanceId
181013	20170731	1	90000000000207008	126813005	en	9000000000013009	Neoplasm of anterior aspect of epiglottis	9000000000448009
182018	20170731	1	90000000000207008	126814004	en	9000000000013009	Neoplasm of junctional region of epiglottis	9000000000448009
183011	20170731	1	90000000000207008	126815003	en	9000000000013009	Neoplasm of lateral wall of oropharynx	9000000000448009
184017	20170731	1	90000000000207008	126816002	en	9000000000013009	Neoplasm of posterior wall of oropharynx	9000000000448009
185016	20170731	1	90000000000207008	126817006	en	9000000000013009	Neoplasm of esophagus	9000000000448009
186015	20170731	1	90000000000207008	126818001	en	9000000000013009	Neoplasm of cervical esophagus	9000000000448009
187012	20170731	1	90000000000207008	126819009	en	9000000000013009	Neoplasm of thoracic esophagus	9000000000448009
188019	20170731	1	90000000000207008	126820003	en	9000000000013009	Neoplasm of abdominal esophagus	9000000000448009
118017	20170731	1	90000000000207008	126822006	en	9000000000013009	Neoplasm of middle third of esophagus	9000000000448009
111018	20170731	1	90000000000207008	126823001	en	9000000000013009	Neoplasm of lower third of esophagus	9000000000448009

Figure 4: Example release format version 2(RF2) from sct2\_Description\_Snapshot-en\_BE1000172\_20251115.txt

This allows for efficient treatment based on UNIX tools such as *wc*, to count number of lines, *grep* to select relevant lines and *awk* to extract relevant columns, perform *joint* operations and format output files as *CSV*, which can afterwards be imported in *MS Excel*.

ICPC-3 is released as an XML file, following ClAML XML scheme (van der Haring et al, 2006), benefiting from tools to check file consistency and sharing this scheme with WHO ICD-10 release files. The WHO have moved to semantic web concepts and tools, including OWL-2 (Tudorache et al., 2010) for ICD-11.

Starting from ICPC-3 XML file, a conversion table from ICPC-3 to ICPC-2 has been extracted as a *DataFrame* using python Pandas library (McKinney, 2011), then inverted to provide a cross path from ICPC-2 coded data such as 3BT to ICPC-3. Pandas has been used throughout the project to manipulate data imported from ICPC-3, ICHI and ICF, as well as the output from the Whoosh-based search engine created for SNOClass.

Most of treatments done on text files pertain to Natural Language Processing (NLP). For NLP, as well as Data Science, Python language environment is often used as it is rich with many libraries, including Whoosh which is used in SNOClass. Python is also the most prominent language for AI.

In addition to Whoosh python library, presented in **section 0**, mapping from SNOMED CT to ICPC-3 relies on several other tools like Excel. Most clinicians are proficient with Excel files and able to perform sorting, filtering, which is why the main interface between data engineering and mapping validation used within SNOClass relies on Excel files. Mapping from SNOMED CT 3BT concepts to ICPC-3 was in part done using an Excel file offering SNOMED CT concept, 3BT related information, and ICPC-3 mapping candidates. A “predicate\_id” column would accept only constrained values to qualify mappings and a free form “comment” column.

## 6. Results

### 6.1 Results from strategyError! Reference source not found.

Based on an existing conversion table from ICPC-3 to ICPC-2 and ICPC-1(van Boven & Napel, 2021), our team generated a reverse conversion table from ICPC-2 to ICPC-3 and applied it to the sample of 4,160 SCT concepts from the previous 3BT project. The number of candidates per concept varied from 1 to 10. We selected within the subset, concepts that had only one ICPC-3 code as candidate for a match, retrieving 1.780 lexical entries, 1.338 SNOMED CT concepts and 342 ICPC-3 classes. This represents a coverage of 32% of the 3BT subset of SNOMED CT and 20% of all ICPC-3 classes. We prepared a sample of 50 of these matches for human validation, which went up to 57 results due to new matches identified by evaluators.

- Most candidate matches (27) correspond to predicate\_id “skos:broadMatch” which is consistent with granularity differences between SNOMED CT and ICPC-3.
- 8 candidates are exact matches. Some are also exact lexical matches (influenza) but others are not, such as “1201005 - Benign essential hypertension (disorder)”, an exact match to “KD73 - Hypertension, uncomplicated”.
- A few cases (7) nevertheless are “skos:narrowMatch”, such as “sctid:2806008 - Impaired psychomotor development (finding)”, a skos:narrowMatch to “icpc3id:PD18 - Disorders of intellectual development”.
- 11 candidate mappings were not correct. For example, mapping with identifier snoclass:icpc3-26 incorrectly suggested a match between “sctid:2177002 - Postherpetic neuralgia (disorder)” and “icpc3id:ND75 - Facial paralysis”. SSSOM metadata “author\_id” allowed to identify the author, who specified the predicate\_id “snoclass:noMatch” and added a comment “correct ICPC-3 code is SD03 Herpes zoster, regional inclusion term: post-herpetic neuralgia SD03.01. See snoclass:icpc3-51”. An operator then added mapping “snoclass:icpc3-51” with suggested ICPC-3 class and predicate\_id “skos:exactMatch”.

Column1	count of mappings	skos:exactMatch	skos:narrowMatch	skos:broadMatch	skos:closeMatch	snoclass:noMatch	snoclass:partialMatch
LBP	179	5	0	172	0	2	0
Validation	57	8	6	27	2	11	3
All	236	13	6	199	2	13	3
LBP%		2.8	0.0	96.1	0.0	1.1	0.0
Validation%		14.0	10.5	47.4	3.5	19.3	5.3
All%		5.5	2.5	84.3	0.8	5.5	1.3

Figure 5 - Distribution of mapping qualifiers, per source and combined (all)

### 6.2 Results from strategy 4.2.3 Hierarchy semantic matching approach

In this approach we explored three concepts: Post-traumatic stress disorder (disorder), Anxiety (finding) and Low back pain (finding). A number of 179 mappings were established:

- As the methodology is manual, most matches (172) are “skos:broadMatch” as expected.

- 2 matches are “snoclass:noMatch” which expresses that some SCT concepts will not have counterparts in ICPC-3, namely “sctid:39093002 - Post-trauma response (finding)” and “sctid:1149252007 - Improvement in response to trauma (finding)”.
- Only 5 are “skos:exactMatch”, such as “sctid:161892003 - Backache with radiation (finding)”, matching with “icpc3id:LD67 Back syndrome with radiating pain”. Again, a consequence of SNOMED CT being more granular than ICPC-3.

Note: Concepts with more children potentially result in a larger number of narrow-to-broad matches. With an appropriate IT tool these children could be easily extracted from the SNOMED CT database, and allocated as narrow-to-broad to the identified ICPC-3 class. Further reading on the notes from the hierarchy matching approach can be found on **Annex 4**.

### 6.3 Results from 4.2.2 The string search bulk approach: Lexical Search Engine

Candidate mappings stemming from this strategy were not validated. Adding ‘AND’ and ‘OR’ leads to nearly 24,600 mapping candidates from 12,273 SCT concept preferred term and synonyms to 1623 ICPC-3 classes, 920 without extension. Experience with mapping SNOMED CT concepts to ICHI suggests applying a score threshold of 10. Below 10, risk of evaluating useless mapping candidates is too high. Hence a total of 3,204 useful mapping candidates (1,100 from AND algorithm, 2,094 from OR algorithm).

Algorithm	Candidate mappings	With score >10	Unique SCT concepts
AND algorithm	1,547	1,110	1,265
OR algorithm	23,354	2,094	10,784

Table 1: Whoosh based Search Engine – results

Further analysis of both algorithms and a score threshold of 10:

Algorithm	Unique SCT	Unique SCT w/o ICPC-3 extensions	Unique ICPC-3	Unique ICPC-3 w/o extensions
AND algorithm, score >10	946	425	794	347
OR algorithm, score >10	1,378	661	603	265

Table 2 - Coverage of SCT and ICPC-3 with and without ICPC-3 extensions

Merging the results of both algorithms, applying a >10 score filter allows to remove double counts and conclude that Whoosh based Search Engine generates candidate mappings that could cover substantial part of Belgian GP subset and ICPC-3, see

	All	SNOCClass SE	SNOCClass SE %
SCT concept	12273	1888	15.4
SCT concept, ICPC-3 w/o ext	12273	912	7.4
ICPC-3 class	1623	886	54.6
ICPC-3 w/o extension	920	400	43.5

**Figure 6 – SNOClass SE (Search Engine) Potential SNOMED CT and ICPC-3 coverage.**

- SNOMED CT concepts: 1888 unique, 15.4% of Belgian GP subset, 912 unique without ICPC-3 extensions, 7.4%.
- ICPC-3 classes: 886 unique, 54.6% of all ICPC-3, 400 unique without ICPC-3 extensions, 43.5%.

	All	SNOClass SE	SNOClass SE %
<b>SCT concept</b>	12273	1888	15.4
<b>SCT concept, ICPC-3 w/o ext</b>	12273	912	7.4
<b>ICPC-3 class</b>	1623	886	54.6
<b>ICPC-3 w/o extension</b>	920	400	43.5

**Figure 6 – SNOClass SE (Search Engine) Potential SNOMED CT and ICPC-3 coverage**

The sum of candidate mappings to evaluate from both algorithms (1,110 from AND, 2,094 from OR) amounts to 3204 mapping candidates. This is still a large number. Similarly to the work done on ICHI, other score thresholds and business rules can be applied to identify irrelevant mapping candidates and focus on the most promising.

Another approach implies combining the different methodological strategies, for example boosting SNOClass Search Engine mapping candidates results when a similar result is found using the reverse-map or the semantic approach. SSSOM formatted tables allow for these approaches to be effective.

In Figure 8 we provide an example of the results of the Whoosh Search Engine.

map_id	subject_id	subject_label	predicate	object_id	object_label	comment	confidence	author
snodclass:icpc3-whoos-3263	sctid:26460006	Slipped upper femoral epiphysis		icpc3id:LD77.03	Slipped upper femoral epiphysis			
snodclass:icpc3-whoos-26802	sctid:782555009	Allergy to cow's milk protein		icpc3id:AD46.02	Cow's milk protein allergy			
snodclass:icpc3-whoos-7937	sctid:61288004	Poisoning caused by venomous snake		icpc3id:AD44.00	Poisoning caused by venomous snake			
snodclass:icpc3-whoos-17673	sctid:233927002	Cardiac arrest with successful resuscitation		icpc3id:KD72.01	Cardiac arrest with successful resuscitation			
snodclass:icpc3-whoos-27542	sctid:300261000119100	Acquired unequal limb length		icpc3id:LD71.00	Acquired unequal limb length			
snodclass:icpc3-whoos-3714	sctid:29943008	Herpes simplex dendritic keratitis		icpc3id:FD05.00	Herpes simplex keratitis dendritic			
snodclass:icpc3-whoos-27690	sctid:16090571000119109	Occupational exposure to toxic agent		icpc3id:2C16.01	Occupational exposure to toxic agents			
snodclass:icpc3-whoos-7636	sctid:59291004	Undelivered in utero foetal death		icpc3id:AD95.01	Undelivered in utero foetal death			
snodclass:icpc3-whoos-6846	sctid:53286005	Medial epicondylitis of elbow joint		icpc3id:LD72.04	Medial epicondylitis of elbow joint			
snodclass:icpc3-whoos-4472	sctid:35726004	Sprain of lateral collateral ligament of knee		icpc3id:LD45.02	Sprain of lateral/medial collateral ligament of knee			

**Figure 7: Whoosh based Search Engine mapping candidates**

## 6.4 Results of Identifying the concepts of the use case “low back pain”

For this approach we worked on tagging all lexical entries in the full narrative of the use case as an alternative methodology to harvest clinically relevant lexical entries. To do so, we used the software MaxQDA and worked with two students from the Honour’s Programme. The students tagged 108 lexical entries. These will later be linked to SNOMED CT concepts and consequently to ICPC-3, ICF and ICHI, and will be used in an openEHR sandbox environment to test generated terminological maps and formally teach medical students clinical record-keeping (see section **Future Steps: Use Case and openEHR**).

## 6.5 Output description

Stemming from the identification of often missing information in mappings, impeding semantic interoperability, the Simple Standard for Sharing Ontological Mappings (SSSOM) (Matentzoglou, 2022) provides a simple and systematic way to describe mappings between conceptual systems. Rooted in Semantic Web concepts and tools, each mapping is a semantic triple.

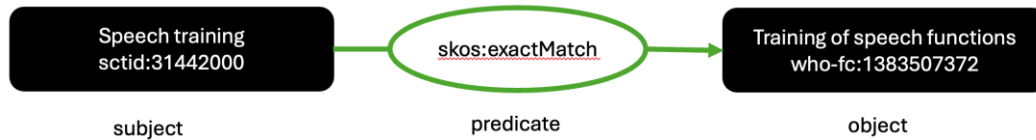


Figure 9: SSSOM mapping triple, example taken from ICHI mapping

Qualifying how two concepts match is paramount to understand the meaning of a mapping. It is particularly important when great differences of granularity exist. SNOMED CT with more than 370 000 concepts and is more than 200 times larger than ICPC-3 with 1623 classes. SSSOM and SNOMED CT provide predicates to qualify matches (e.g. exact match, narrow match, broad match, no match, also partial/contextual match) and add metadata (e.g. for SNOMED CT first addition of mapping, date of current version). SSSOM also supports the effort to make mappings FAIR (Findable, Accessible, Interoperable and Reusable) by offering a systematized way to record more metadata on mappings: author, date of mapping, mapping tool, mapping justification, etc. For SNOClass, this metadata is useful for traceability of work, and makes the export to SNOMED CT maps, which use only a subset of the metadata, possible.

map_id	subject_id	subject_label	predicate_id	object_id	object_label	comment	confidence	author_id
snoclass:icpc3-1	sctid:4494009	Diverticulitis of large intestine (disorder)	skos:broadMatch	icpc3id:DD77	Diverticular disease		100	Bianca De Sà e
snoclass:icpc3-2	sctid:4556007	Gastritis (disorder)	skos:broadMatch	icpc3id:DD71	Gastritis or duodenitis or both		100	Bianca De Sà e
snoclass:icpc3-3	sctid:4855003	Retinopathy due to diabetes mellitus (disorder)	snoclass:noMatch	icpc3id:TD72	Type 2 diabetes mellitus	regional code (inclusion) diabetic retinopathy FD67.01    from the ICPC-3 browser: double code known	100	Bianca De Sà e
snoclass:icpc3-4	sctid:5050001	Senile angioma (disorder)	snoclass:noMatch	icpc3id:KS99	Other specified symptoms, complaints, abnormal lymphangioma		100	Bianca De Sà e
snoclass:icpc3-5	sctid:5089007	Disorder of vulva (disorder)	snoclass:partialMatch	icpc3id:GS18	Vulval symptoms or complaints	248858001   Vulva finding (finding)	75	Bianca De Sà e
snoclass:icpc3-6	sctid:5370000	Atrial flutter (disorder)	skos:broadMatch	icpc3id:KD68	Atrial fibrillation or flutter		100	Bianca De Sà e
snoclass:icpc3-7	sctid:5387003	Pigmented hairy epidermal nevus (disorder)	skos:broadMatch	icpc3id:SD27	Benign melanocytic naevus		100	Bianca De Sà e
snoclass:icpc3-8	sctid:5468008	Fracture of multiple sites of bone (morphologic abnormality)	skos:broadMatch	icpc3id:AD35	Multiple trauma and injuries		100	Bianca De Sà e

Figure 10. SSSOM mapping, showing metadata

In total, 236 mappings have been established and reviewed as of January 2026, see **Error! Reference source not found.**

Column1	count of mappings	skos:exactMatch	skos:narrowMatch	skos:broadMatch	skos:closeMatch	snoclass:noMatch	snoclass:partialMatch
LBP	179	5	0	172	0	2	0
Validation	57	8	7	27	2	11	2
All	236	13	7	199	2	13	2
LBP%		2.79	0.00	96.09	0.00	1.12	0.00
Validation%		14.04	12.28	47.37	3.51	19.30	3.51
All%		5.51	2.97	84.32	0.85	5.51	0.85

Figure 11. Metrics on SSSOM formatted mapping results

## 6.6 Outreach activities

The team was keen to make the work within the SNOClass project public, as well as to connect and discover similar projects happening worldwide. During the project, two important networking events were identified and therefore given special attention within our timeline. These were the World Conference of the World Organization of National Colleges, Academies

and Academic Associations of General Practitioners/Family Physicians (WONCA, 18-21 September 2025 Lisbon, and the SNOMED CT Expo, 22-24 October 2025, Antwerp.

### **WONCA 2025 World Conference Lisbon**

We prepared two e-poster presentations for this conference, the first about the general SNOClass project approach and the second more specifically about the work on mapping SNOMED CT to ICPC-3 and updating the 3BT thesaurus.

Additionally, we were invited by the WONCA International Classification Committee (WICC) to present our work on their open day. We were given a one-hour timeslot and asked to talk about the future of ICPC, including the opportunities and challenges to medical coding with the advent of AI. We had an audience of both conference participants and WICC members, online and in person. Our presentation was extremely well received, paving the way for an enduring collaboration with WICC and their expert advice on this work.

### **SNOMED CT 2025 Expo Antwerp**

During the lightning session at the SNOMED Expo in Antwerp, the focus was on the next step in the evolution of semantic interoperability in primary care: the alignment between SNOMED CT, ICPC-3, and national terminological infrastructures.

We emphasized that good communication in clinical practice starts with correct and unambiguous registration. In a person-centred care context, language is not merely a technical tool but a core instrument for conveying clinical meaning accurately. Terminologies and classifications are essential to make this meaning machine-readable and reusable, without losing the primary care perspective.

A central element of the presentation was the Belgian Bi-classified Bi-lingual Thesaurus (3BT) as the historical foundation for structured data entry in Belgian general practice. Building on this legacy, work is now underway to evolve 3BT into a Belgian GP reference set, connected to SNOMED CT as the international reference terminology.

The mapping between SNOMED CT and ICPC-3 was presented as a necessary but complex exercise, due to differences in granularity and coverage. To address this, carefully curated subsets (refsets) are being developed that align with the language and needs of primary care. This work is embedded within the broader SNOClass project, which also includes mappings to ICF and ICHI.

The session concluded with a clear message: the future lies in a modern, multilingual end-user terminology, where human language and computer language are effectively connected. Data entry should remain simple for clinicians, while the underlying semantics must be rich enough to support interoperability, data reuse, and person-centred care. The “lights are green” to collectively take this next step toward SNOMED CT and ICPC-3 integration.

During the conference several international contacts were established with the Observational Health Data Sciences Initiative (OHDSI) Vocabulary Commission, with the terminology experts of the SNOMED International Organisation, and with other general practice academic centres in Austria, Denmark and Finland.

## 7. Future Steps and Initiatives

During the run of this first year of the SNOClass project we explored the complexity of SCT and ICPC-3, developed and tested different mapping methodologies, explored its application on a real-life scenario with the use-case, and connected with a network of researchers who are developing similar efforts across the globe.

For the future, there are several initiatives aligned with our mapping efforts that will take place both in the context of a follow-up national project but also in concurrent national and international projects that are happening in harmony with it. In this section we will describe some of these initiatives, with a bigger focus on the ones planned by our team. This includes creating a comprehensive map, and building on our international connections to create a network of researchers dedicated to completing and maintaining a SNOMED CT to ICPC-3 map.

The use case of low-back-pain will be expanded into an Objective Structured Clinical Examination (OSCE)-based narrative in an openEHR platform for educational purposes. This openEHR platform will also provide the ability to test the performance of AI-powered search and decision support strategies. Furthermore, we will also touch upon the initiatives outside of the scope of our project. Considering the fast progress of eHealth systems, the transition into Fast Healthcare Interoperability Resources (FHIR) and the creation of the Belgian Integrated Health Record, the modernization of the 3BT thesaurus and the ontologisation of ICPC-3 are necessary efforts that will be supported by our team in the future, in the context of international collaboration.

### 7.1. Expert Panel Validation

We extended an invitation to a group of experts comprised of current and former members of the WONCA International Classification Committee. These are academics working directly with designing, launching, maintaining and updating ICPC-3. Many of them have experience in implementing ICPC-2 in their home countries and have been involved in generating maps between ICPC-2 and SNOMED CT. We have invited key experts onto an advisory panel for future initiatives : Gustavo Gusso (Chair of WICC), Kees van Boven, Elena Cardillo, Julie Gordon, Oystein Hetlevik.

We have presented our project and preliminary results at the WICC meeting in Lisbon in 2025, during the WONCA World Conference. The work was well received and generated significant interest. Arrangements have been made for future collaboration and for reciprocal feedback between our groups. The next WICC meeting will be organised in Ghent and hosted by our team from **9 to 13 October, 2026**, and we are expected to present further developments on our work during this meeting.

## 7.2. Completing an ICPC-3 comprehensive map

Year one of the SNOClass project was focused on developing different methodological approaches. A proposed follow-up project will focus on validating the results produced by the different methodologies and selecting one automated methodology to focus on. The goal is to generate a comprehensive and high-quality map to cover the entirety of the ICPC-3 classification, prioritising SCT concepts that are exact or close matches with ICPC-3 classes, meaning concepts with a higher level of aggregation and lower granularity. This map will comprise a subset of SNOMED CT concepts and will not cover the entirety of SCT. To be able to map as many SCT concepts as possible a different strategy will be necessary. The lexical string comparison method using the Whoosh tool from the Python library will be used on the evolving Belgian GPrefset, with a methodology to efficiently select the best match from potential candidates. The manual semantic matching approach will be refined to include efficient extraction and evaluation of more specific SNOMED CT concepts that are children of matched concepts.

## 7.3. Use-case and openEHR to support educational activities

Clinical record-keeping is an important skill for future doctors to learn. We intend to expand the application of the use case we have developed in the first year of our project as an educational tool to teach medical students how to register their patient encounters and to test our maps on a simulated patient scenario that closely resembles real life.

To do so we will partner with the Unit Medical Informatics to develop an openEHR platform. This platform will be supported by the maps from SNOMED CT to the three classifications worked with in this project. The students will be instructed on how to use the software, and what are good practices for registering a patient encounter within the logic of Episode of Care and using the Subjective-Objective-Assessment-Plan (SOAP) method. Subsequently they will be presented with an OSCE-based exercise (Objective Standardized Clinical Examination), where a simulated patient enacts the narrative developed in our use-case low back pain, with the addition that beyond interviewing, and examining the patient, with the subsequent choice of the appropriate treatment, instructions and follow up, the student will also be asked to write down their notes in this openEHR platform. With the input from the students, the software will generate SNOMED CT-based records and provide output in ICPC-3, ICF and ICHI, therefore serving as an educational tool, a validation strategy and a beta test for future eHealth platforms in Belgium.

## 7.4. Leveraging AI-powered strategies

SNOClass has relied on existing resources, NLP and expert evaluation for selecting and evaluating candidate matches from SNOMED CT to ICPC-3, and for building validated quality mappings. AI-based techniques have been considered and relevant literature reviewed, showing intense research activity in the medical domain (e.g. over 40,740 results over a year published

on PubMed in October 2025). Likewise, within family medicine, for example, at the WONCA World conference 2025, 29 communications cited AI. The keynote of this conference “Family Medicine and Artificial Intelligence – A Human Touch” from Seyma Handan Akyon focused on balanced AI perspectives for General Practitioners.

Within SNOClass sophisticated AI techniques have not yet been implemented as the results obtained with NLP were sufficient to establish a methodology. Early attempts with AI were not satisfactory. AI-based projects succeed when tackling precise tasks according to “State of AI in business 2025” by MIT NANDA project (Challapally et al., 2025). Mapping from SNOMED CT to ICPC-3 could be a precise enough task. Techniques available to SNOClass start from *cosine similarity* search, as available in spaCy(Miranda et al.,2022), and extend to *Retrieval-augmented generation* (RAG) to mitigate hallucinations, and *Large Language Model* (LLM) fine-tuning based on specific resources, such as SNOMED CT and ICPC-3.

ICPC-3 is a recent resource and there is a lack of ICPC-3 related validated data available to generic AI systems. This problem is comparable to the situation described in (Wild, 2025) “*ChatGPT recognizes only 10-20% sentences written in Hausa, a language spoken by 94 million people in Nigeria.*” As a result, generic AI are not trained and fine-tuned on ICPC-3.

In acknowledgement of the above, SNOClass is creating datasets that enable AI for mapping SNOMED CT to ICPC-3. Pre-existing “Bilingual Biclassified Belgian Thesaurus” (3BT) for General Practice constitutes a rich language oriented clinical resource carefully mapped to ICPC-2 and ICD10, and now to SNOMED-CT and ICPC-3. Generative AI builds on data and increasingly structure (Yang et al., 2025). 3BT extended to SNOMED CT and with SNOClass to ICPC-3 is a collection of lexical representations of concepts associated to conceptual entities that can be used to improve automated, AI supported, coding of General Practice, through SNOMED CT mapping to ICPC-3.

## **7.5. International network for creating a SNOMED CT comprehensive map to ICPC-3**

Our work has identified the hierarchy matching approach as the strategy best suited to achieve the goal of mapping as many SNOMED CT concepts as possible to ICPC-3. However, it requires a slow, detail-oriented work process to be completed by a team of coders trained in both SCT and ICPC-3 coding. Considering the full size of SNOMED CT, such a large-scale effort cannot be undertaken by one single research group.

We have identified several academic groups working on connecting ICPC-3 to end-user resources and on the implementation of this new version of ICPC (which is yet to be fully implemented anywhere in the world). To achieve the ambitious goal of mapping SNOMED CT in its entirety, we intend to do the following:

1. Create training modules on how to map SNOMED CT to ICPC-3 using the hierarchy matching approach and building an OSCE-based use-case for an openEHR platform for validation;
2. Using contacts we have already established, invite research groups to participate in training sessions for mapping;
3. Invite each participating research group to choose one or more themes from the list of around 200 relevant themes for general practice(Jansen et al., 2018) and perform the mapping technique on the relevant concepts;
4. Validate the results via the OSCE use-case openEHR method and perform crude human validation on a sample of the resulting maps centrally within our research group;
5. Create an on-line platform where we will publish the results and welcome feedback and volunteers to participate in our mapping efforts.

International collaboration on terminology for primary care should be coordinated through the World Association of Family Doctors (World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians: WONCA). The WONCA International Classification Committee (WICC), the oldest working party of WONCA, is responsible for governing the management of the ICPC-3 classification. Historically, there has been a long-standing and intensive collaboration between the WICC and the Department of Public Health and Primary Care at Ghent University. During the annual WICC meeting in September 2025 in Lisbon, the project was presented to this group of experts. Many of the members are actively involved in the implementation of SNOMED CT within their healthcare systems and have long-standing experience with the registration of activities in primary care. The project was enthusiastically received, with the proposed approach and the overarching long-term implementation vision being perceived as innovative. Further collaboration and the potential sharing of tasks were informally agreed upon.

By leveraging our contacts and networks within the WHO Collaborating Centre on Family Medicine and Primary Health Care, Ghent University, we hope to stimulate further collaboration within Belgium and beyond its borders across other European countries and regions. This falls within several of the WHO-CC core activities on advancing high-quality primary health care through exploring strategies to closer align primary care with secondary and tertiary care, and better horizontal inter-professional cooperation within primary care teams.

## **7.6. Maintenance and Updating**

Maintenance of the mapping is essential to ensure relevance over time of the correspondence between SNOMED CT concepts and ICPC-3 classes.

The source and target resources come from different organizations and have different release frequency and format:

- (a) Release frequency:

- SNOMED CT International and Belgian editions are released monthly.
- ICPC-3 updates are not planned, and releases are published when they are ready and less than yearly.

(b) Formats:

- SNOMED CT editions are released using the RF2 format, as tab-separated values.
- ICPC-3 editions are released as an XML file, following the ClaML schema.
- Both formats allow for automated detection of change (addition, modification, suppression)

SNOMED CT editions are released more often than ICPC-3 and contains for each row an *effectiveTime* value that allows to identify modifications to the terminology and listing them. Depending on the list size, manual mapping when appropriate or software assisted identification of ICPC-3 candidates can be performed using the same tools than for the initial mapping task.

Change identification in ICPC-3 is more complex, has no time tag is associated with change. But the XML release format is stable, and given the smaller size of the resources, tools created to extract data from it allow for a simple change identification algorithm.

## 7.7. Ontologisation of ICPC-3 together with WICC

We have initiated a discussion with WICC on the future of ICPC-3 in the context of SNOMED CT large adoption. Part of the proposal is to update ICPC-3 from an XML ClaML resource to an ontology form, on par with SNOMED CT and WHO-FIC classifications. Converting XML to OWL-2 ontology will preserve all pre-existing classification semantics and enable rich intra-class relationships (hierarchies, equivalences, disjointedness) as well as facilitate interlink and comparison with external resources (SNOMED-CT, ICHI, ICF, 3BT and others). Based on ontological features and existing toolsets, semantic querying with SPARQL (query language like SQL) will be possible. Maintenance of complex semantic resources is difficult; SNOMED CT relies on ontological principles (Schulz et al., 2023) to help with finding and removing cyclical references within the terminology. ICPC-3 is smaller by large but semantic reasoners applied to an ontological form of it would identify such issues and support their resolution. A vast ecosystem of health-related ontological resources exists, such as BioPortal(National Center for Biomedical Ontology, n.d.) with 1,242 ontologies as of writing, fostering semantic interoperability in healthcare. ICPC-3 is so far absent. An ontologisation of ICPC-2 exists (Cardillo, 2009) but has not been exploited for the creation of ICPC-3.

This rewriting will preserve all existing classification semantics and allow for ampler modifications, adoption and reuse. It will enable rich intra class relationships (hierarchies, equivalence, disjointedness) thanks to W3C OWL-2 expressivity, facilitate interlink ICPC 3 with

SNOMED CT, ICHI, ICF, and other medical resources built on ontologies, and allow for the creation of reusable SPARQL endpoint for downstream analytics and EMR integration.

### **7.8. Modernization of 3BT**

The Belgian Bilingual Biclassified Thesaurus (3BT) has served its purpose as the backbone of longitudinal epidemiological research. It can be considered as a lexico-conceptual resource, supporting clinical coding at the point-of-care. With the advent of SNOMED CT though as a reference terminology and the arrival of AI with scribe functions, the need for bridging language for humans and conceptual systems for computers will only increase.

3BT could evolve to a multilingual medical dictionary, linked to SNOMED CT and domain classifications. Such an endeavour is only possible in the European context. A consortium of expert centres in France, Ireland, Belgium, and Austria is preparing a project proposal for that matter.

### **7.9. Aligning with the Belgian Integrated Health Record**

The Belgian Integrated Health Record (RIZIV, 2025) aims to create a working environment where data relating to health care is used in an integrated manner. To this end, “authentic sources” will be developed, consisting of 15 categories: 1. Problem list; 2. Clinical data; 3. Laboratory; 4. Imaging; 5. Medication overview; 6. Vaccinations; 7. Allergies; 8. Telemonitoring data ; 9. Social Factors; 10. Family Context; 11. Life Goals; 12. Care Plan & Care Team; 13. BelRAI Evaluation; 14. Patient Will; 15. Implants. These sources are to be accessible to the patient and the healthcare providers involved who have a “therapeutic relationship” with the patient. The agreement is that these resources must be FHIR-compatible and must at least use SNOMED CT as terminology with adequate mapping to the international classifications used in our country. SNOMED CT ensures the international usability of information and interoperability.

Contacts are registered in the context of the ‘Episode of Care’ (with the following categories: ‘Reason for Encounter, Interview, Examination, Hypothesis/Diagnosis, Planning’). This uses existing international classifications (ICD-11, ICF, ICPC-3, ICHI, etc.), all of which must be mapped to the terminology (SNOMED CT). Mapping makes it possible to work with different healthcare providers to co-create information about patient encounters and to make efficient use of linking pathways, for example, for interaction with hospitals.

## **8. Lessons Learned**

Our experience revealed that there is no straightforward way to achieve full automation in this context. Attempts to automate processes or integrate AI-based tools should be preceded by a thorough manual familiarization with the systems involved. This preliminary step is essential to

ensure informed decisions regarding the selection of appropriate tools and the design of effective AI or other automated solutions.

During the run of this project, we developed a manual semantic approach for mapping SNOMED CT to ICPC-3 and applied it to three initial concepts – Post-traumatic stress disorder (disorder), Anxiety (finding), and Low back pain (finding) – yielding 179 matches. We validated a sample of 50 matches derived from a sample of 4,160 SCT concepts from the initial 3BT project and the ICPC-3 conversion table. Finally, we performed a Whoosh search for the expanded Belgian GP RefSet with 12,273 SCT concepts, generating a number of high-quality candidate matches still to be validated. The next step is to finish the validation of the initial 3BT sample and to validate the matches provided by the Whoosh search engine. This will generate a substantial first map between SNOMED CT and ICPC-3.

Collaboration proved highly beneficial throughout the project. Working closely with the other two teams in the SNOClass project facilitated knowledge exchange, improved efficiency and deepened insight into the nature of the ICPC-3 classification, as contrasted with the other WHOFIC classifications.

Another critical insight is the need for guarantees that the ICPC classification system will evolve into a mature, well-maintained classification. Sustained development and governance are vital for its long-term reliability and relevance.

Finally, to complete medium- and long-term objectives, international cooperation and crowdsourcing will be indispensable. We observed significant international interest in our work, during the SNOMED Expo in Antwerp 2025 and in communication with the WONCA International Classification Committee. Our work is widely perceived as an important contribution to the future of ICPC, reinforcing the value of continued investment and global engagement in this endeavour.

## **9. Conclusion and Recommendations**

General Practice encompasses a domain as vast as SNOMED CT itself, owing to the broad nature of Family Medicine and Primary Care. The scope of this domain stretches over the entirety of SNOMED, making the task of mapping approximately 350,000 concepts to 1,500 ICPC classes quite daunting. Initial experiments with various methodologies have demonstrated that automation is not self-evident; manual semantic work remains important, necessary, but laborious.

Future progress will depend on further elaboration of the methodology and sensible use of automation and AI tools to support the task. To maintain feasibility, the focus should be restricted to clinical cases that are common in General Practice and prioritized in medical education. This targeted approach will help to contain the complexity of the task.

Our work to date has concentrated on developing and exploring potential methodologies, and illustrating the approaches with exemplary mappings. The next step will involve selecting and

refining the most suitable approach to enable upscaling and broader implementation. Mapping the Belgian GP reference set can be considered as a feasible ambition. However, to map the entirety of SNOMED CT, international collaboration will be critical for success, both to share expertise and to manage the scale of the undertaking.

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## 11. Appendices

### A. Mapping Table Samples

3BT SNOMED CT concepts to ICPC-3 classes validation through ICPC-3 conversion table, SSSOM formatted sample

map_id	subject_id	subject_label	predicate_id	object_id	object_label	comment
snoclass:icpc3-3	sctid:4494009	Diverticulitis of large intestine (disorder)	skos:broadMatch	icpc3id:DD77	Diverticular disease	
snoclass:icpc3-2	sctid:4556007	Gastritis (disorder)	skos:broadMatch	icpc3id:DD71	Gastritis or duodenitis or both	
snoclass:icpc3-3	sctid:4855003	Retinopathy due to diabetes mellitus (disorder)	snoclass:noMatch	icpc3id:TD72	Type 2 diabetes mellitus	correct match is FD67 Retinopathy    regional code (inclusion) diabetic retinopathy FD67.01    from the ICPC-3 browser: double code known causative disease, e.g. diabetes TD71 - TD72
snoclass:icpc3-4	sctid:5050001	Senile angioma (disorder)	snoclass:noMatch	icpc3id:KS99	Other specified symptoms, cc	correct match is SD28 Haemangioma or lymphangioma
snoclass:icpc3-5	sctid:5089007	Disorder of vulva (disorder)	snoclass:partialMatch	icpc3id:GS18	Vulval symptoms or complaint	correct match in SNOMED would be 248858001  Vulva finding (finding)
snoclass:icpc3-6	sctid:5370000	Atrial flutter (disorder)	skos:broadMatch	icpc3id:KD68	Atrial fibrillation or flutter	
snoclass:icpc3-7	sctid:5387003	Pigmented hairy epidermal nevus (disorder)	skos:broadMatch	icpc3id:SD27	Benign melanocytic naevus	
snoclass:icpc3-8	sctid:5468008	Fracture of multiple sites of bone (morphologic)	skos:broadMatch	icpc3id:AD35	Multiple trauma and injuries	
snoclass:icpc3-9	sctid:5468008	Fracture of multiple sites of bone (morphologic)	skos:broadMatch	icpc3id:AD35	Multiple trauma and injuries	
snoclass:icpc3-1	sctid:6055000	Burn of upper limb (disorder)	skos:broadMatch	icpc3id:SD41	Burn or scald	
snoclass:icpc3-3	sctid:6142004	Influenza (disorder)	skos:exactMatch	icpc3id:RD07	Influenza	
snoclass:icpc3-1	sctid:6142004	Influenza (disorder)	skos:exactMatch	icpc3id:RD07	Influenza	
snoclass:icpc3-1	sctid:3135009	Otitis externa (disorder)	skos:closeMatch	icpc3id:HD01	Otitis externa	

Low Back Pain mapping, SSSOM formatted sample

map_id	subject_id	subject_label	predicate_id	object_id	object_label	comment
lbpid:1	sctid:2473660	Acute back pain with sciatica (finding)	skos:narrowMatch	icpc3id:LD67	Back syndrome with radiating pain	
lbpid:2	sctid:1618930	Back pain worse on sneezing (finding)	skos:narrowMatch	icpc3id:LS02	Back symptom or complaint	
lbpid:3	sctid:1618920	Backache with radiation (finding)	skos:exactMatch	icpc3id:LD67	Back syndrome with radiating pain	
lbpid:4	sctid:1344070	Chronic back pain (finding)	skos:narrowMatch	icpc3id:LS02	Back symptom or complaint	
lbpid:5	sctid:1358600	Exacerbation of backache (finding)	skos:narrowMatch	icpc3id:LS02	Back symptom or complaint	
lbpid:6	sctid:2790390	Low back pain (finding)	skos:narrowMatch	icpc3id:LS03	Low back symptom or complaint	children are mapped, but not grandchildren
lbpid:7	sctid:2790410	Myofascial pain syndrome of lower back (disorder)	skos:narrowMatch	icpc3id:LD66	Back syndrome without radiating pain	
lbpid:8	sctid:3030810	Neurogenic claudication (finding)	skos:narrowMatch	icpc3id:LD67	Back syndrome with radiating pain	
lbpid:9	sctid:2790490	Pain in back following surgical procedure (finding)	skos:narrowMatch	icpc3id:LS02	Back symptom or complaint	
lbpid:10	sctid:3478900	Pain in coccyx (finding)	skos:narrowMatch	icpc3id:LS03	Low back symptom or complaint	

## B. ICPC-3 data extraction

From ICPC-3 XML ClaML source, all data extracted as a spreadsheet, sample

code	kind	pref	index	desc	extcode	extlabel	hintcode
G502	symptom	Other specified general pain	pain or other us				
G504	symptom	Pain in breast					2F84
G505	symptom	Menstrual pain	period pain   primary dysmenorrhoea   secondary dysmenorrhoea				2F84
G506	symptom	Intermenstrual pain	cyclic pelvic pain				2F84
G507	symptom	Absent or scanty menstruation	menstrual period				
G508	symptom	Excessive menstruation	anovulatory bleeding   excessive bleeding   excessive and frequent menstruation   heavy menstrual bleeding   menorrhagia				
G509	symptom	Irrregular or frequent menstruation	excessive and frequent menstruation   short menstrual cycle				
G510	symptom	Intermenstrual bleeding	bleeding between periods   intermenstrual bleeding - irregular   menstrual spotting				
G511	symptom	Premenstrual symptoms or complaints	premenstrual disturbances   premenstrual syn Symptoms or complaints characterised by cyclic emotional, physical, or behavioural symptoms such as mood				
G513	symptom	Menopausal symptoms or complaints	artificial menopause   states associated with artificial menopause				
G514	symptom	Postmenopausal bleeding	A condition of the genital system, caused by polyps, endometrial atrophy, hyperplasia, or cancer. This conditio				
G515	symptom	Postcoital bleeding	bleeding from cervix	A condition of the genital system, caused by infection, cervical ectropion, cervical or endometrial polyps, canc			
G516	symptom	Vaginal discharge	fluor vaginalis				
G517	symptom	Other specified vaginal symptoms or complaints	complaint of vagina   vaginal discomfort				
G518	symptom	Vulval symptoms or complaints	pruritus vulvae   sensory disturbance of vulva				2F86
G519	symptom	Pelvis symptoms or complaints	pelvic congestion syndrome				
G520	symptom	Penis symptoms or complaints	irritation of penis				2F86
G521	symptom	Scrotum or testis symptoms or complaints	male genitalia dermatoses   penoscrotal pruritis   pruritis scroti				
G522	symptom	Prostate symptoms or complaints	prostatic pain				
G523	symptom	Painful intercourse	non-psychogenic dyspareunia   sexual pain-penetration disorder   vaginospasm				2F84   2F86
G524	symptom	Impotence or erectile dysfunction	Male erectile dysfunction is characterised by inability or marked reduction in the abilit				2F86
G525	symptom	Other specified sexual function symptoms or complaints	anorgasm   orgasm incapacity				2F86
G526	symptom	Lump or mass in breast					
G527	symptom	Nipple symptoms or complaints	fissure or fistula of nipple   inversion of nipple				
G528	symptom	Other specified breast symptoms or complaints	complaint breast   galactorrhoea   hypertrophy of breast   induration of breast   non puerperal				
G529	symptom	Infertility or subfertility	azoospermia   female infertility   fertility prob Failure to conceive after 1 year of trying to get pregnant.				W599
G550	clinicalFinding	Abnormal cervix smear	dysplasia of cervix uteri				
G590	complaint	Concern about breast appearance					
G591	complaint	Concern or fear of sexual dysfunction		Concern about or fear of sexual dysfunction in a patient without sexual dysfunction.			2F86
G592	complaint	Concern or fear of sexually transmitted infection	fear of contracting venereal disease	Concern about or fear of sexually transmitted disease in a patient without the disease and until the diagnosis is			

## C. ICPC-3 Desk Version

	<p>AP80 Asymptomatic carrier  AP80.00 Carrier of chromosome disorder  AP80.01 Hepatitis B carrier  AP80.02 Carrier, risk for environment or children  AP80.03 Carrier, risk for him-, or herself  AP80.04 Carrier of G6PD  AP80.05 Carrier of sickle cell  AP80.06 Carrier of thalassemia  AP99 Other specified prevention and case finding</p>	<p>AD25 Malignancy  AD26 Other specified benign, uncertain or in situ neoplasms  AD35 Multiple trauma and injuries  AD36 Other specified and unknown trauma and injury  AD37 Secondary effect of trauma  AD40 Poisoning by medical agent  AD41 Adverse effect of medical agent  AD41.00 Drug allergy  AD41.01 Drug induced headache  AD41.02 Spotting using hormonal contraception  AD42 Complication of medical treatment  AD42.00 Adverse effect of vaccination  AD42.01 Dehiscence episiotomy  AD43 Side-effect of prosthetic device  AD44 Toxic effect of non-medicinal substance  AD44.00 Poisoning caused by venomous snake  AD45 Adverse effect of physical factor  AD45.00 Chilblains (perniones)  AD45.01 Heat stroke and sunstroke  AD45.02 Motion sickness  AD46 Other specified and unknown allergy or allergic reaction  AD46.00 Anaphylactic shock  AD46.01 Angioneurotic oedema  AD46.02 Cow's milk protein allergy</p>
<p><b>Legend</b>  Symptoms  Clinical Finding  Complaint  Infection  Neoplasm  Trauma  Congenital  Other diagnosis  Process</p>	<p>AQ01 Health promotion related to reproductive and sexual health  AQ02 Health promotion related to growth, development and ageing  AQ03 Health promotion related to prevention of injury  AQ04 Health promotion related to prevention of violence  AQ05 Health promotion related to substance abuse  AQ99 Other specified health promotion</p>	<p>AD55 Congenital anomaly, other specified or unknown  AD55.00 Complete trisomy 21 syndrome (Down syndrome)  AD65 Premature newborn  AD66 Other specified and unknown perinatal morbidity  AD95 Perinatal mortality  AD95.00 Newborn death  AD95.01 Undelivered in utero foetal death  AD96 Death  AD96.00 Natural death  AD96.01 Unnatural death  AD99 Other specified or unknown general diseases or conditions of unspecified site</p>
<p><b>General reasons for visit</b>  AF01 Procreative management  AF01.00 Wanting children  AF02 Oral contraception  AF03 Intrauterine contraception  AF04 Post-coital contraception  AF04.00 Morning after pill method of contraception  AF04.01 Postcoital intrauterine contraceptive device fitted  AF05 Other specified contraception  AF05.00 Contraceptive diaphragm (pessarium occlusivum) device  AF05.01 Depot contraception  AF05.02 Sheath contraception, condom  AF06 Sterilization  AF99 Other specified family planning</p>	<p>AR01 Encounter related to presence of devices, implants or grafts  AR01.00 Presence of pacemaker or implantable cardioverter defibrillator (ICD)/pacemaker  AR02 Encounter related to presence of artificial opening  AR02.00 Living with a stoma  AR03 Encounter related to presence of transplanted organ or tissue  AR03.00 Status after transplant  AR04 Encounter related to postponement of menstruation  AR99 Other specified reasons for visit</p>	<p>AD65 Premature newborn  AD66 Other specified and unknown perinatal morbidity  AD95 Perinatal mortality  AD95.00 Newborn death  AD95.01 Undelivered in utero foetal death  AD96 Death  AD96.00 Natural death  AD96.01 Unnatural death  AD99 Other specified or unknown general diseases or conditions of unspecified site</p>
<p>AG01 General examination and investigation of persons without complaint or reported diagnosis  AG02 Other specified general examinations and investigations of persons without complaint or reported diagnosis  AG03 Examination and encounter for certification purposes  AG04 Routine general health check-up of defined subpopulation  AG99 Other specified general and routine examinations</p>	<p><b>General</b>  AS01 General pain in multiple sites  AS02 Chills  AS03 Fever  AS04 General weakness or tiredness  AS05 Postviral fatigue  AS05.00 Chronic fatigue syndrome  AS06 Feeling ill  AS07 Fainting  AS08 Frailty  AS09 Swelling and generalized edema  AS10 Sweating problem  AS10.00 Localised hyperhidrosis  AS10.01 Night sweats  AS11 Bleeding  AS12 Chest pain  AS13 Irritable infant  AS14 Fall of unknown origin  AS50 Other specified abnormal result investigation  AS50.00 Elevated blood glucose level  AS50.01 Subclinical hypothyroidism  AS50.02 Subclinical hyperthyroidism  AS52 Shock  AS53 Coma  AS90 Concern or fear of disease  AS91 Concern or fear of medical treatment  AS92 Concern about appearance  AS99 Other specified general symptoms, complaints and abnormal findings  AS99.00 Cold extremities</p>	<p><b>Blood</b>  BS01 Lymph gland(s) symptom or complaint  BS50 Splenomegaly  BS51 Unexplained changes in white blood cells  BS52 Elevated erythrocyte sedimentation rate  BS90 Concern or fear of disease of blood, blood-forming organs and immune system  BS99 Other specified symptoms, complaints or abnormal findings of blood, blood-forming organs and immune system</p>
<p>AI01 Introduction to practice and health provider  AI02 Patient treatment and care preferences  AI03 Patient preferences about end of life care  AI99 Other specified introduction and patient treatment preferences</p> <p>AP01 Special screening examination for neoplasms  AP01.00 Special screening examination for neoplasm of breast  AP01.01 Special screening examination for neoplasm of cervix  AP01.02 Special screening examination for neoplasm of colon and rectum  AP01.03 Special screening examination for neoplasm of lung  AP01.04 Special screening examination for neoplasm of prostate  AP01.05 Special screening examination for neoplasm of skin</p>	<p>AD01 Measles  AD02 Chickenpox  AD03 Rubella  AD04 Infectious mononucleosis  AD13 Other specified and unknown viral exanthems  AD13.00 Erythema infectiosum (fifth disease)  AD13.01 Exanthema subitum (6th disease/roseola infantum)  AD13.02 Hand foot and mouth disease  AD14 Other specified and unknown viral diseases  AD14.00 Chikungunya fever  AD14.01 Dengue fever  AD14.02 Dengue haemorrhagic fever  AD14.03 Ebola virus disease  AD14.04 Hantavirus disease  AD14.05 Lassa fever  AD14.06 Rabies  AD14.07 Yellow fever  AD14.08 Zika virus disease  AD15 Tuberculosis  AD16 Malaria  AD17 Leishmaniasis  AD17.00 Cutaneous leishmaniasis  AD17.01 Mucocutaneous leishmaniasis  AD17.02 Visceral leishmaniasis  AD23 Sepsis  AD24 Other specified and unknown infectious diseases  AD24.00 African trypanosomiasis  AD24.01 Chagas disease (South American trypanosomiasis)  AD24.02 Filariasis  AD24.03 Infection caused by Onchocerca volvulus  AD24.05 Lyme disease  AD24.06 Leprosy (Hansen's disease)  AD24.07 Loiasis  AD24.08 Lymphatic filariasis  AD24.09 Scarlet fever</p>	<p>BD01 Lymphadenitis acute  BD02 Other specified or unknown lymphadenitis  BD03 Asymptomatic HIV-infection  BD04 Symptomatic HIV-infection/AIDS  BD25 Malignant neoplasm of blood, blood-forming organs and immune system  BD25.00 Hodgkin lymphoma  BD25.01 Malignant lymphoma, other classified  BD25.02 Leukaemia  BD25.03 Plasma cell myeloma  BD25.04 Burkitt lymphoma  BD26 Benign, uncertain or in-situ neoplasm of blood, blood-forming organs and immune system  BD35 Injury of blood, blood-forming organs and immune system  BD35.00 Traumatic ruptured spleen  BD55 Congenital anomaly of blood, blood-forming organs and immune system  BD65 Hereditary haemolytic anaemia  BD65.00 Haemolytic anaemia due to glucose-6-phosphate dehydrogenase deficiency  BD65.01 Sickle cell disorders or other haemoglobinopathies  BD65.02 Thalassemias  BD66 Iron deficiency anaemia  BD67 Vitamin B12 anaemia or folate deficiency anaemia  BD67.00 Folate deficiency anaemia  BD67.01 Megaloblastic anaemia due to vitamin B12 deficiency  BD77 Other specified and unknown anaemias  BD77.00 Severe anaemia  BD78 Coagulation defect  BD78.00 Hereditary factor VIII deficiency  BD78.01 Hereditary factor IX deficiency  BD78.02 Immune thrombocytopenic purpura  BD78.03 Thrombophilia  BD99 Other specified or unknown blood, blood-forming organs, immune system diagnoses or diseases  BD99.00 Immunodeficiency  BD99.01 Sarcoidosis</p>
<p>AP10 Special screening examination for infectious and parasitic diseases  AP10.00 Special screening for infections with a predominantly sexual mode of transmission  AP15 Special screening examination for diabetes mellitus  AP16 Special screening examination for cardiovascular disorders  AP20 Encounter for immunisation  AP21 Encounter for immunisation against influenza  AP22 Encounter for immunisation against COVID-19  AP40 Reasons for visit related to lifestyle  AP45 Persons encountering health services for other counselling and medical advice  AP50 Contact with and exposure to communicable diseases  AP60 Potential health hazards related to personal history  AP65 Potential health hazards related to family history  AP65.00 Family history of diabetes  AP65.01 Family history of ischaemic heart disease and other diseases of circulatory system  AP65.04 Family history of hypercholesterolaemia  AP65.06 Use of DES by mother  AP66 Potential health hazards related to family history of cancer  AP66.00 Family history of breast cancer  AP66.01 Family history of colon cancer  AP66.02 Family history of ovary cancer  AP70 Potential health hazards related to public health</p>	<p>AD01 Measles  AD02 Chickenpox  AD03 Rubella  AD04 Infectious mononucleosis  AD13 Other specified and unknown viral exanthems  AD13.00 Erythema infectiosum (fifth disease)  AD13.01 Exanthema subitum (6th disease/roseola infantum)  AD13.02 Hand foot and mouth disease  AD14 Other specified and unknown viral diseases  AD14.00 Chikungunya fever  AD14.01 Dengue fever  AD14.02 Dengue haemorrhagic fever  AD14.03 Ebola virus disease  AD14.04 Hantavirus disease  AD14.05 Lassa fever  AD14.06 Rabies  AD14.07 Yellow fever  AD14.08 Zika virus disease  AD15 Tuberculosis  AD16 Malaria  AD17 Leishmaniasis  AD17.00 Cutaneous leishmaniasis  AD17.01 Mucocutaneous leishmaniasis  AD17.02 Visceral leishmaniasis  AD23 Sepsis  AD24 Other specified and unknown infectious diseases  AD24.00 African trypanosomiasis  AD24.01 Chagas disease (South American trypanosomiasis)  AD24.02 Filariasis  AD24.03 Infection caused by Onchocerca volvulus  AD24.05 Lyme disease  AD24.06 Leprosy (Hansen's disease)  AD24.07 Loiasis  AD24.08 Lymphatic filariasis  AD24.09 Scarlet fever</p>	<p><b>Digestive system</b>  DS01 General abdominal pain  DS02 Epigastric pain  DS03 Heartburn  DS04 Rectal or anal pain  DS05 Perianal itching</p>

DS06 Other specified localized abdominal pain	DD67 Gastro-oesophageal reflux disease	FD67 Retinopathy
DS07 Dyspepsia	DD67.00 Gastro-oesophageal reflux disease with oesophagitis	FD67.00 Arteriosclerotic retinopathy
DS08 Flatulence, gas and belching	DD67.01 Gastro-oesophageal reflux disease without oesophagitis	FD67.01 Diabetic retinopathy
DS09 Nausea	DD68 Other specified or unknown oesophagus disease	FD68 Macular degeneration
DS10 Vomiting	DD68.00 Barrett's oesophagitis	FD69 Disorders of refraction and accommodation
DS11 Diarrhoea	DD68.01 Benign esophageal stricture	FD69.00 Astigmatism
DS12 Constipation	DD68.02 Oesophageal diverticulum	FD69.01 Hypermetropia
DS13 Jaundice	DD68.03 Zenker's diverticulum	FD69.02 Myopia
DS14 Haematemesis	DD69 Duodenal ulcer	FD69.03 Presbyopia
DS15 Melana	DD70 Other specified or unknown peptic ulcer	FD70 Cataract
DS16 Rectal bleeding	DD70.00 Ulcus ventriculi	FD70.00 Senile cataract
DS17 Incontinence of bowel	DD71 Gastritis or duodenitis or both	FD71 Glaucoma
DS18 Change in faeces and bowel movements	DD72 Appendicitis	FD71.00 Narrow-angle glaucoma
DS19 Teeth, gum symptom or complaint	DD73 Inguinal hernia	FD71.01 Open-angle glaucoma
DS20 Mouth, tongue, lip symptom or complaint	DD74 Hiatus hernia	FD71.02 Raised intraocular pressure
DS20.00 Dry mouth	DD75 Umbilical hernia	FD71.03 Secondary glaucoma
DS20.01 Glossodynia	DD76 Other specified or unknown abdominal hernia	FD72 Blindness
DS20.02 Halitosis	DD76.00 Femoral hernia	FD73 Strabismus
DS21 Swallowing problem	DD76.01 Incisional hernia	FD74 Pterygium
DS50 Hepatomegaly	DD77 Diverticular disease	FD99 Other specified or unknown diagnosis or diseases of eye and adnexa
DS51 Abdominal distension or abdominal mass or both	DD78 Irritable bowel syndrome	FD99.00 Ectropion
DS51.00 Ascites	DD79 Inflammatory bowel disease	FD99.01 Entropion
DS90 Concern or fear of disease of digestive system	DD79.00 Regional enteritis	FD99.02 Episcleiritis
DS99 Other specified or unknown symptoms, complaints, abnormal findings of digestive system	DD79.01 Ulcerative colitis	FD99.03 Scleritis
	DD80 Anal fissure or anal fistula or both	FD99.04 Posterior vitreous detachment
	DD80.00 Anal fissure	
	DD80.01 Fistula ani	<b>Genital system</b>
DD01 Gastrointestinal infection	DD81 Other specified or unknown liver diseases	GS01 Pain in penis
DD01.00 Amoebiasis	DD81.00 Cirrhosis of liver	GS02 Pain in testis
DD01.01 Campylobacter	DD81.01 Steatosis of liver	GS03 Other specified genital pain
DD01.02 Giardia	DD82 Cholecystitis or cholelithiasis or both	GS04 Pain in breast
DD01.03 Salmonellosis	DD82.00 Cholangitis	GS05 Menstrual pain
DD01.04 Shigella	DD82.01 Cholecystitis	GS06 Intermenstrual pain
DD01.05 Typhoid	DD82.02 Cholelithiasis	GS07 Absent or scanty menstruation
DD01.06 Yersinia enterocolitica	DD83 Coeliac disease	GS07.00 Amenorrhoea
DD01.07 Cholera	DD84 Haemorrhoids	GS07.02 Oligomenorrhoea
DD01.08 Cryptosporidiosis	DD99 Other specified or unknown diagnoses or diseases of digestive system	GS08 Excessive menstruation
DD02 Mumps	DD99.00 Entrapment of intestine in abdominal adhesions	GS09 Irregular or frequent menstruation
DD03 Viral hepatitis	DD99.01 Ileus	GS09.00 Irregular periods
DD03.00 Acute viral hepatitis A	DD99.02 Intestinal intussusception	GS09.01 Polymenorrhoea
DD03.01 Acute viral hepatitis B	DD99.03 Pancreatitis	GS10 Intermenstrual bleeding
DD03.02 Acute viral hepatitis C	DD99.04 Peritonitis	GS10.00 Ovulation bleeding
DD03.03 Acute viral hepatitis E		GS11 Premenstrual symptoms or complaints
DD03.04 Chronic viral hepatitis B		GS13 Menopausal symptoms or complaints
DD03.05 Chronic viral hepatitis C		GS13.00 Atrophic vaginitis
DD03.06 Chronic viral hepatitis D		GS13.01 Menopausal flushing
DD03.07 Chronic viral hepatitis E		GS14 Postmenopausal bleeding
DD05 Gastroenteritis presumed infection		GS15 Postcoital bleeding
DD05.00 Diarrhoeal disease	<b>Eye</b>	GS16 Vaginal discharge
DD06 Perianal abscess	FS01 Eye pain	GS17 Other specified vaginal symptoms or complaints
DD07 Intestinal helminths	FS02 Red eye	GS18 Vulval symptoms or complaints
DD07.00 Ascariasis	FS03 Eye discharge	GS19 Pelvis symptoms or complaints
DD07.01 Oxyuriasis	FS03.00 Watery eye	GS20 Penis symptoms or complaints
DD07.02 Taeniasis	FS04 Visual floaters or spots	GS21 Scrotum or testis symptoms or complaints
DD07.05 Schistosomiasis	FS05 Decreased visual acuity	GS21.00 Swelling of testis
DD07.06 Strongyloidiasis	FS06 Other specified visual disturbances	GS22 Prostate symptoms or complaints
DD07.07 Hookworm disease	FS07 Dry eye or other abnormal eye sensations	GS23 Painful intercourse
DD07.08 Trichuriasis	FS07.00 Dry eye (syndrome)	GS24 Impotence or erectile dysfunction
DD07.09 Cysticercosis	FS08 Abnormal eye appearance	GS25 Other specified sexual function symptoms or complaints
DD07.10 Echinococcosis	FS09 Eye/ed symptoms or complaints	GS26 Lump or mass in breast
DD25 Malignant neoplasm of stomach	FS09.00 Blepharochalasis	GS27 Nipple symptoms or complaints
DD26 Malignant neoplasm of large intestine	FS09.01 Xanthelasma palpebrarum	GS27.00 Nipple discharge
DD27 Malignant neoplasm of pancreas	FS10 Glasses or contact lenses symptoms or complaints	GS28 Other specified breast symptoms or complaints
DD28 Other specified or unknown malignant digestive neoplasm	FS99 Other specified symptoms, complaints, abnormal findings of eye	GS28.00 Gynaecomastia
DD28.00 Malignant neoplasm of lips/mouth/tongue		GS29 Infertility or subfertility
DD28.01 Malignant neoplasm of liver	FD01 Infectious conjunctivitis	GS50 Abnormal cervix smear
DD28.02 Malignant neoplasm of oesophagus	FD01.00 Bacterial conjunctivitis	GS90 Concern about breast appearance
DD28.03 Malignant neoplasm of pharynx	FD01.01 Viral conjunctivitis	GS91 Concern or fear of sexual dysfunction
DD28.04 Malignant neoplasm of salivary glands	FD02 Blepharitis or sty or chalazion	GS92 Concern or fear of sexually transmitted infection
DD28.05 Malignant neoplasm of gallbladder and bile ducts	FD02.00 Blepharitis	GS93 Concern or fear of breast cancer
DD29 Benign or uncertain neoplasm or carcinoma in situ neoplasm of digestive system	FD02.01 Chalazion	GS94 Other specified concern or fear of disease of genital system
DD29.00 Familial polyposis syndrome	FD02.02 Hordeolum	GS94.00 Fear of prostate cancer
DD35 Injury of digestive system	FD03 Other specified or unknown eye infections or inflammations	GS99 Other specified symptoms, complaints and abnormal findings of genital system
DD36 Foreign body in digestive system	FD03.00 Dacryocystitis	
DD55 Congenital anomaly of digestive system	FD03.01 Iridocyclitis	
DD55.00 Cleft lip/gum/palate	FD03.02 Keratitis	
DD55.01 Congenital pyloric stenosis	FD04 Trachoma	GD01 Syphilis
DD55.02 Meckels diverticulum	FD05 Corneal ulcer	GD02 Gonorrhoea
DD55.03 Tongue-tie	FD05.00 Herpes simplex keratitis dendritic	GD03 Genital herpes
DD65 Teeth or gum disease or both	FD25 Neoplasm of eye or adnexa	GD04 Genital trichomoniasis
DD65.00 Gingivitis	FD25.00 Benign neoplasm eye	GD05 Genital human papilloma virus infection
DD65.01 Temporomandibular joint disorder	FD25.01 Malignant tumor of eye	GD06 Genital Chlamydia infection
DD65.02 Caries of deciduous teeth	FD25.02 Uncertain neoplasm of eye	GD06.00 Cervicitis caused by Chlamydia
DD65.03 Caries of permanent teeth	FD35 Contusion or haemorrhage eye or both	GD06.01 Pelvic inflammatory disease by Chlamydia
DD66 Mouth, tongue or lip diseases	FD35.00 Black eye	GD06.02 Vaginitis caused by Chlamydia
DD66.00 Angular stomatitis	FD35.01 Subconjunctival hemorrhage	GD06.03 Chlamydia-infection male
DD66.01 Candidiasis of mouth, oral sprue	FD36 Other specified and unknown injury of eye	GD07 Other specified or unknown sexual transmitted disease
DD66.02 Oral aphthae	FD36.00 Corneal abrasion	GD07.00 Lymphogranuloma venereum
DD66.03 Salivary stone	FD36.01 Snow blindness	GD08 Genital candidiasis or balanitis
	FD37 Foreign body in eye	GD08.00 Candida balanitis
	FD55 Congenital stenosis or stricture of lacrimal duct	GD09 Pelvic inflammatory disease
	FD56 Other specified or unknown congenital anomaly of eye	GD10 Prostatitis or seminal vesiculitis or both
	FD65 Allergic conjunctivitis	GD11 Orchitis or epididymitis
	FD66 Detached retina	GD11.00 Epididymitis
		GD11.01 Orchitis

GD12 Vaginitis or vulvitis	KD01 Infection of circulatory system	LD01 Infection of musculoskeletal system
GD12.00 Vaginosis (bacterial)	KD02 Rheumatic heart disease	LD01.00 Bacterial (septic) arthritis
GD25 Malignant neoplasms of cervix	KD02.00 Acute rheumatic fever with heart disease	LD01.01 Osteomyelitis
GD26 Malignant neoplasms of prostate	KD02.01 Acute rheumatic fever without heart disease	LD25 Malignant neoplasm musculoskeletal system
GD27 Malignant neoplasms of breast	KD25 Neoplasms circulatory system	LD26 Benign, uncertain or carcinoma in situ musculoskeletal
GD27.00 Adenocarcinoma mammae	KD25.00 Benign cardiovascular neoplasm	LD26.00 Benign musculoskeletal neoplasm
GD28 Other specified or unknown malignant genital neoplasms	KD25.01 Malignant cardiovascular neoplasm	LD35 Fracture of radius or ulna or both
GD28.00 Adenocarcinoma of endometrium	KD25.02 Uncertain cardiovascular neoplasm	LD36 Fracture of tibia or fibula or both
GD28.01 Malignancy of ovaries	KD35 Injury of circulatory system	LD37 Fracture of hand or foot bone or both
GD28.02 Malignant neoplasm of penis	KD55 Congenital anomaly of circulatory system	LD37.00 Fracture phalanx hand
GD28.03 Malignant neoplasm of testis	KD55.00 Congenital anomaly of atrial septum	LD37.01 Fracture phalanx foot
GD28.04 Malignant neoplasm of uterus	KD55.01 Congenital ventricular septal defect	LD38 Fracture of femur
GD29 Fibromyoma of uterus or cervix or both	KD65 Acute coronary syndrome	LD38.00 Fracture of neck of femur
GD29.00 Myoma of uterus	KD65.00 Acute myocardial infarction	LD39 Other specified and unknown fracture
GD30 Benign neoplasms of breast	KD65.01 Unstable angina pectoris	LD39.00 Fracture nasal bones
GD31 Benign neoplasms of genital system	KD66 Chronic ischaemic heart disease	LD39.01 Fracture of clavicle
GD32 Genital neoplasm, in situ or uncertain	KD66.00 Coronary sclerosis	LD39.02 Fracture of humerus
GD35 Genital injuries	KD66.01 Old myocardial infarction	LD39.03 Fracture of rib
GD35.00 Corpus alienum genital tract	KD66.02 Stable angina	LD39.04 Fracture of vertebral column
GD35.01 Female genital mutilation	KD67 Heart failure	LD39.05 Fracture of pelvis
GD55 Congenital anomaly of genital system	KD67.00 Acute heart failure	LD39.06 Fracture of patella
GD55.00 Imperforate hymen	KD67.01 Chronic heart failure	LD39.07 Fracture of skull
GD55.01 Retracted testis	KD67.02 Left ventricular heart failure with mid range or reduced ejection fraction	LD45 Trauma of joint and ligaments of knee
GD56 Hypospadias	KD67.03 Left ventricular heart failure with preserved ejection fraction	LD45.00 Acute derangement of knee
GD57 Undescended testicle	KD68 Atrial fibrillation or flutter	LD45.01 Rupture/sprain of cruciate ligaments of knee
GD65 Cervical disease	KD69 Paroxysmal tachycardia	LD45.02 Sprain of lateral/medial collateral ligament of knee
GD65.00 Cervical erosion	KD69.00 Supraventricular tachycardia	LD45.03 Tear of meniscus of knee
GD65.01 Cervical polyp	KD69.01 Ventricular tachycardia	LD46 Sprain or strain of ankle
GD66 Uterovaginal prolapse	KD70 Cardiac arrhythmia or conduction disorder or both	LD47 Other specified and unknown sprain or strain of joint
GD66.00 Cystocele	KD70.00 Atrioventricular block	LD47.00 Whiplash injury of neck
GD66.01 Rectocele	KD70.01 Long Q-T syndrome	LD48 Dislocation or subluxation
GD67 Fibrocystic disease breast	KD70.02 Sick-sinus syndrome	LD48.00 Closed subluxation/open dislocation jaw
GD68 Premenstrual tension syndrome	KD70.03 Supraventricular extrasystoles	LD48.01 Dislocation/subluxation acromioclavicular joint
GD69 Endometriosis	KD70.04 Ventricular extrasystoles	LD48.02 Dislocation/subluxation finger
GD70 Benign prostatic hypertrophy	KD70.05 Wolf-Parkinson-White syndrome	LD48.03 Dislocation/subluxation shoulder joint
GD71 Hydrocele or spermatocele or both	KD71 Heart valve disease	LD48.04 Subluxation radial head
GD71.00 Hydrocele	KD71.00 Cardiac valve prolapse	LD49 Other specified musculoskeletal injury
GD71.01 Spermatocele	KD71.01 Mitral valve insufficiency or incompetence or mitral regurgitation	LD49.00 Contusion of rib
GD72 Phimosis or paraphimosis	KD71.02 Stenosed aortic valve	LD49.01 Tear musculus gastrocnemius
GD99 Other specified and unknown diagnoses and diseases of genital system	KD72 Other specified and unknown heart disease	LD55 Congenital anomaly of musculoskeletal system
GD99.00 Bartholinitis	KD72.00 Cardiac arrest	LD55.00 Cervical rib
GD99.01 Mastitis (non-lactating)	KD72.01 Cardiac arrest with successful resuscitation	LD55.01 Congenital dislocation of hip/dysplasia
GD99.02 Ovarian cyst	KD72.02 Cardiomyopathy	LD55.02 Spina bifida occulta
GD99.03 Torsion of testis	KD73 Hypertension, uncomplicated	LD55.03 Talipes equinovarus
	KD74 Hypertension, complicated	LD65 Neck syndrome
<b>Ear</b>	KD75 Postural hypotension	LD65.00 Cervical herniation of nucleus pulposus
HS01 Ear pain or ache	KD76 Atherosclerosis or peripheral vascular disease	LD66 Back syndrome without radiating pain
HS02 Hearing complaint	KD76.00 Intermittent claudication	LD66.00 Spondylosis
HS03 Tinnitus, ringing or buzzing ear	KD76.01 Raynaud's syndrome	LD66.01 Spondylolysis/spondylolisthesis
HS04 Ear discharge	KD76.02 Thromboangiitis obliterans	LD67 Back syndrome with radiating pain
HS05 Bleeding ear	KD77 Pulmonary embolism	LD67.00 Lumbar or thoracic disc prolapse with radiculopathy
HS06 Plugged feeling in ear	KD78 Thrombosis or phlebitis or thrombophlebitis	LD68 Shoulder syndrome
HS90 Concern or fear of ear disease	KD78.00 Deep vein thrombosis	LD69 Patella disorder
HS91 Concern about appearance of ears	KD78.01 Superficial vein thrombophlebitis	LD69.00 Retropatellar chondromalacia
HS99 Other specified symptoms, complaints, abnormal findings of ear	KD79 Varicose veins	LD70 Acquired deformity of spine
	KD79.00 Scroial varices/varicocele	LD70.00 Scoliosis deformity of spine
HD01 Otitis externa	KD79.01 Venous insufficiency	LD71 Acquired deformity of limb
HD02 Acute otitis media or myringitis	KD99 Other specified and unknown diagnoses and diseases of the circulatory system	LD71.00 Acquired unequal limb length
HD03 Serous otitis media	KD99.00 Aortic aneurysm or dissection	LD71.01 Hallux valgus
HD04 Eustachian salpingitis	KD99.01 Diabetic peripheral angiopathy	LD71.02 Hammer toe
HD05 Chronic otitis media	KD99.02 Oesophageal varices	LD71.03 Mallet finger
HD05.00 Cholesteatoma	KD99.03 Arteritis temporalis	LD71.04 Talipes (pes) planus
HD05.02 Mastoiditis	KD99.04 Lymphoedema	LD72 Other specified and unknown bursitis, tendinitis, synovitis
HD25 Neoplasm of ear		LD72.00 Acquired trigger finger
HD25.00 Benign neoplasm of ear	<b>Musculatory system</b>	LD72.01 Bursitis
HD25.01 Malignant neoplasm of ear	LS01 Neck symptom or complaint	LD72.02 Calcaneus spur
HD25.02 Uncertain neoplasm of ear	LS02 Back symptom or complaint	LD72.03 Dupuytren's contracture
HD35 Acoustic trauma	LS03 Low back symptom or complaint	LD72.04 Medial epicondylitis of elbow joint
HD36 Foreign body in ear	LS04 Musculoskeletal chest symptom or complaint	LD72.05 Tendinitis/tenosynovitis
HD37 Other specified or unknown ear injury	LS05 Flank or axilla symptom or complaint	LD72.06 Achilles tendinitis
HD55 Congenital anomaly of ear	LS06 Jaw symptom or complaint	LD72.07 Trochanteric bursitis
HD55.00 Bat ears	LS07 Shoulder symptom or complaint	LD72.08 Radial styloid tenosynovitis (de Quervain)
HD65 Perforation of ear drum	LS08 Arm symptom or complaint	LD72.09 Ganglion
HD66 Excessive ear wax	LS09 Elbow symptom or complaint	LD72.10 Plantar fascial fibromatosis
HD67 Vestibular syndrome	LS10 Wrist symptom or complaint	LD73 Tennis elbow
HD67.00 Benign paroxysmal positional vertigo	LS11 Hand or finger (or both) symptom or complaint	LD74 Rheumatoid arthritis and related conditions
HD67.01 Labyrinthitis	LS12 Hip symptom or complaint	LD74.00 Ankylosing spondylitis (M. Bechterew/Bekhterev's disease)
HD67.02 Meniere disease	LS13 Leg or thigh (or both) symptom or complaint	LD74.01 Rheumatoid arthritis
HD68 Presbycusis	LS14 Knee symptom or complaint	LD75 Gout
HD69 Deafness	LS15 Ankle symptom or complaint	LD76 Polymyalgia rheumatica
HD99 Other specified or unknown diagnoses or diseases of ear and mastoid	LS16 Foot or toe (or both) symptom or complaint	LD77 Osteochondrosis
	LS16.00 Metatarsalgia	LD77.00 Legg-Calve-Perthes disease
<b>Circulatory system</b>	LS17 Muscle pain	LD77.01 Osgood-Schlatter disease
KS01 Pain, pressure, tightness of heart	LS18 Chronic widespread pain	LD77.02 Osteochondritis dissecans
KS02 Palpitations, awareness of heart	LS18.00 Primary fibromyalgia syndrome	LD77.03 Slipped upper femoral epiphysis
KS03 Irregular heartbeat	LS19 Muscle symptom or complaint	LD78 Osteoarthritis of hip
KS04 Ankle oedema	LS20 Other specified joint symptoms or complaints	LD79 Osteoarthritis of knee
KS50 Low blood pressure	LS90 Concern or fear of disease of musculoskeletal system	LD80 Other specified and unknown osteoarthritis
KS51 Elevated blood pressure	LS99 Other specified symptoms, complaints and abnormal findings of musculoskeletal system	LD81 Osteoporosis
KS52 Heart murmur or arterial murmur or both		LD81.00 Osteopenia
KS90 Concern or fear of disease of circulatory system		
KS99 Other specified symptoms, complaints, abnormal findings of circulatory system		

LD99 Other specified diagnoses and diseases of musculoskeletal system LD99.00 Hypermobility syndrome LD99.01 Instability knee LD99.02 Loose body in joint LD99.03 Nonunion of fracture LD99.04 Old meniscus injury LD99.05 Psoriatic arthritis LD99.06 Tietze's disease LD99.07 Non-traumatic derangement of knee LD99.08 Postural plagiocephalie	PS07 Sexual desire and fulfilment problem PS07.00 Premature ejaculation PS07.01 Primary erectile dysfunction PS07.02 Vaginismus of psychogenic origin PS08 Gender incongruence problem PS09 Eating problem in child PS10 Bedwetting or enuresis PS11 Encopresis PS12 Chronic alcohol problem PS12.00 Alcohol dependence PS12.01 Alcohol withdrawal delirium PS12.02 Alcoholism PS12.03 Binge drinker PS12.04 Korsakoff's psychosis PS13 Acute alcohol intoxication PS14 Tobacco smoking problem PS15 Medication abuse PS16 Drug abuse PS16.00 Abuse or addiction hard drugs PS16.01 Abuse/addiction soft drugs PS17 Memory or attention problem PS18 Child behaviour symptom or complaint PS19 Adolescent behaviour symptom or complaint PS20 Specific learning problems PS20.00 Developmental disorder of motor function PS20.01 Developmental language disorder PS20.02 Developmental speech disorder PS20.03 Dyslexia PS21 Own illness problem PS21.00 Dependence on others PS22 Phase of life problem PS22.00 Empty-nest problem PS22.01 Retirement problem PS90 Concern, fear of mental disorder or problem PS99 Other specified psychological/mental symptom/complaint/abnormal finding	RS13 Voice symptoms or complaints RS14 Haemoptysis or coughing blood RS15 Abnormal sputum or phleg RS50 Pleurisy or pleural effusion RS90 Concern or fear of disease respiratory system RS91 Concern about appearance of nose RS99 Other specified respiratory symptoms, complaints and abnormal findings RS99.00 Hiccough RS99.01 Irritable airways
<b>Neurological system</b>		
NS01 Headache NS02 Pain, face NS03 Restless legs NS04 Tingling fingers, feet, toes NS05 Sensation disturbances NS06 Convulsion or seizure NS06.00 Febrile seizures NS07 Abnormal involuntary movements NS08 Disturbance of smell, taste or both NS09 Vertigo or dizziness NS09.00 Lightheaded NS09.01 Rotatory vertigo NS10 Paralysis and weakness NS11 Speech problem NS11.00 Stammering NS90 Concern or fear of neurological disease NS99 Other specified symptoms, complaints and abnormal findings of neurological system	PS21 Own illness problem PS21.00 Dependence on others PS22 Phase of life problem PS22.00 Empty-nest problem PS22.01 Retirement problem PS90 Concern, fear of mental disorder or problem PS99 Other specified psychological/mental symptom/complaint/abnormal finding	RD01 Pertussis RD02 Acute upper respiratory infection RD02.00 Acute pharyngitis RD02.01 Common cold RD03 Acute or chronic rhinosinusitis RD03.00 Acute sinusitis RD03.01 Chronic sinusitis RD04 Acute tonsillitis RD04.00 Peritonsillar abscess RD04.01 Streptococcal throat RD05 Acute (obstructive) laryngitis or tracheitis or both RD05.00 Acute subglottis laryngitis RD06 Acute bronchitis or bronchiolitis or both RD06.00 Acute bronchitis RD06.01 Acute bronchiolitis RD07 Influenza RD08 Coronavirus disease 2019 (COVID-19) RD08.00 Long COVID-19 RD09 Pneumonia RD09.00 Legionella pneumonia RD10 Other specified or unknown respiratory infection RD10.00 Diphtheria RD10.01 Epiglottitis RD10.02 Severe acute respiratory syndrome (SARS) RD25 Malignant neoplasm bronchus and lung RD26 Other specified or unknown respiratory malignant neoplasm RD26.00 Malignant neoplasm of larynx RD27 Benign neoplasm respiratory RD28 Uncertain or carcinoma in situ neoplasm of respiratory system RD35 Injury respiratory system RD36 Foreign body in nose, larynx, bronchus RD55 Congenital anomaly of respiratory system RD65 Allergic rhinitis RD66 Hypertrophy tonsils or adenoids or both RD66.00 Hypertrophy of adenoids RD66.01 Hypertrophy of tonsils RD66.02 Hypertrophy of tonsils and adenoids RD67 Chronic bronchitis RD68 Chronic obstructive pulmonary disease and emphysema RD69 Asthma RD69.00 Allergic asthma RD70 Lung disease related to external agents RD70.00 Pneumoconiosis RD70.01 Vaping related disorder RD99 Other specified or unknown diagnoses and diseases of respiratory system RD99.00 Aspiration pneumonia RD99.01 Bronchiectasis RD99.02 Cystic fibrosis RD99.03 Deviated nasal septum RD99.04 Pneumothorax RD99.05 Polyp of nasal cavity RD99.06 Polyp of vocal cord RD99.07 Respiratory failure RD99.08 Interstitial lung disease
ND01 Poliomyelitis ND01.00 Acute poliomyelitis ND02 Meningitis, encephalitis or both ND02.00 Bacterial meningitis ND02.01 Encephalitis ND02.02 Myelitis ND02.03 Viral meningitis ND03 Tetanus ND04 Other specified and unknown neurological infection ND04.00 Slow-virus infection ND25 Neoplasm nervous system ND25.00 Benign neoplasm nervous system ND25.01 Malignant neoplasm nervous system ND25.02 Neoplasm of uncertain behaviour nervous system ND35 Concussion ND36 Other specified and unknown head injury ND36.00 Cerebral contusion ND36.01 Epidural intracranial haematoma ND36.02 Traumatic intracranial haemorrhage ND36.03 Traumatic subdural intracranial haemorrhage ND37 Other specified and unknown injury neurological system ND55 Congenital anomaly of neurological system ND55.00 Congenital hydrocephalus ND55.01 Spina bifida ND65 Multiple sclerosis ND66 Parkinsonism ND66.00 Parkinson's disease ND67 Epilepsy ND68 Transient cerebral ischaemia ND69 Stroke or cerebrovascular accident ND69.00 Cerebral infarction ND69.01 Non traumatic intracranial haemorrhage ND69.02 Subarachnoid intracranial haemorrhage ND70 Cerebrovascular disease ND71 Migraine ND72 Cluster headache ND73 Tension headache ND74 Trigeminal neuralgia ND75 Facial paralysis ND76 Carpal tunnel syndrome ND77 Peripheral neuritis, neuropathy or both ND77.00 Common peroneal neuropathy ND77.01 Diabetic neuropathy ND77.02 Guillain-Barré syndrome ND77.03 Meralgia paraesthetica ND77.04 Morton's neuroma ND77.05 Phantom pain ND77.06 Thoracic outlet syndrome ND77.07 Neuralgic shoulder amyotrophy ND99 Other specified and unknown diagnoses and diseases of neurological system ND99.00 Amyotrophic lateral sclerosis ND99.01 Combined disorder of muscle and peripheral nerve ND99.02 Myasthenia gravis ND99.03 Tic disorder ND99.04 Cerebral palsy	PD01 Dementia PD01.00 Alzheimer's disease PD01.01 Vascular dementia PD02 Other specified and unknown organic mental disorder PD02.00 Delirium PD03 Schizophrenia PD04 Affective psychosis PD04.00 Bipolar disorder PD05 Other specified or unknown psychosis PD06 Anxiety disorder or anxiety state PD06.00 Generalised anxiety disorder PD06.01 Panic disorder PD06.02 Phobia PD07 Obsessive-compulsive or related disorder PD08 Adjustment disorders PD09 Post traumatic stress disorder PD10 Bodily distress or somatisation disorder PD11 Burn-out PD12 Depressive disorder PD12.00 Dysthymia PD12.01 Postpartum depression PD13 Mixed depressive and anxiety disorder PD14 Suicide or suicide attempt PD14.00 Suicide attempt PD14.01 Suicide PD15 Personality disorder PD15.00 Borderline personality disorder PD16 Attention deficit hyperactivity disorder PD17 Eating disorder PD17.00 Anorexia nervosa PD17.01 Bulimia PD18 Disorders of intellectual development PD19 Autism spectrum disorders PD19.00 Autistic disorder PD99 Other specified or unknown psychological or mental diagnoses or diseases PD99.00 Compulsive gambling	RD01 Pertussis RD02 Acute upper respiratory infection RD02.00 Acute pharyngitis RD02.01 Common cold RD03 Acute or chronic rhinosinusitis RD03.00 Acute sinusitis RD03.01 Chronic sinusitis RD04 Acute tonsillitis RD04.00 Peritonsillar abscess RD04.01 Streptococcal throat RD05 Acute (obstructive) laryngitis or tracheitis or both RD05.00 Acute subglottis laryngitis RD06 Acute bronchitis or bronchiolitis or both RD06.00 Acute bronchitis RD06.01 Acute bronchiolitis RD07 Influenza RD08 Coronavirus disease 2019 (COVID-19) RD08.00 Long COVID-19 RD09 Pneumonia RD09.00 Legionella pneumonia RD10 Other specified or unknown respiratory infection RD10.00 Diphtheria RD10.01 Epiglottitis RD10.02 Severe acute respiratory syndrome (SARS) RD25 Malignant neoplasm bronchus and lung RD26 Other specified or unknown respiratory malignant neoplasm RD26.00 Malignant neoplasm of larynx RD27 Benign neoplasm respiratory RD28 Uncertain or carcinoma in situ neoplasm of respiratory system RD35 Injury respiratory system RD36 Foreign body in nose, larynx, bronchus RD55 Congenital anomaly of respiratory system RD65 Allergic rhinitis RD66 Hypertrophy tonsils or adenoids or both RD66.00 Hypertrophy of adenoids RD66.01 Hypertrophy of tonsils RD66.02 Hypertrophy of tonsils and adenoids RD67 Chronic bronchitis RD68 Chronic obstructive pulmonary disease and emphysema RD69 Asthma RD69.00 Allergic asthma RD70 Lung disease related to external agents RD70.00 Pneumoconiosis RD70.01 Vaping related disorder RD99 Other specified or unknown diagnoses and diseases of respiratory system RD99.00 Aspiration pneumonia RD99.01 Bronchiectasis RD99.02 Cystic fibrosis RD99.03 Deviated nasal septum RD99.04 Pneumothorax RD99.05 Polyp of nasal cavity RD99.06 Polyp of vocal cord RD99.07 Respiratory failure RD99.08 Interstitial lung disease
<b>Psychological system</b>	<b>Respiratory system</b>	<b>Skin</b>
PS01 Feeling anxious or nervous or tense PS02 Acute stress reaction PS03 Feeling sad PS04 Feeling or being irritable or angry PS05 Suicidal ideation PS06 Sleep disturbance	RS01 Pain respiratory system RS02 Shortness of breath RS03 Wheezing RS04 Other specified breathing problem RS05 Snoring RS06 Sleep-related breathing problems RS06.00 Sleep apnoea RS07 Cough RS08 Nose bleed or epistaxis RS09 Sneezing or nasal congestion RS10 Nose symptoms or complaints RS11 Sinus symptoms or complaints RS12 Throat symptoms or complaints RS12.00 Pain in throat	SS01 Pain or tenderness of skin SS02 Pruritus SS03 Lump or swelling of skin localised SS04 Lump or swelling of skin generalised SS05 Rash localised SS06 Rash generalised SS07 Skin colour change SS07.00 Cyanosis SS08 Skin texture symptom or complaint SS08.00 Dry skin SS08.01 Induration of skin SS09 Nail symptom or complaint SS10 Hair loss or baldness SS11 Other specified hair or scalp symptom or complaint SS11.00 Change in hair colour SS11.01 Hirsutism SS90 Concern or fear of disease of skin SS99 Other specified symptoms, complaints and abnormal findings of skin

SD01 Warts	SD76 Acne	US04 Urinary retention
SD02 Molluscum contagiosum	SD76.00 Acne conglobata	US05 Other specified urination problems
SD03 Herpes zoster	SD76.01 Acne vulgaris	US05.00 Anuria/oliguria
SD03.01 Postherpetic neuralgia	SD77 Chronic ulcer of skin	US06 Haematuria
SD04 Herpes simplex	SD77.00 Pressure sore	US07 Other specified urine symptom or complaint
SD04.00 Herpes (simplex) labialis	SD77.01 Venous ulcer of leg	US08 Other specified bladder symptom or complaint
SD05 Infected finger or toe	SD77.02 Diabetic foot ulcer	US09 Kidney symptom or complaint
SD05.00 Paronychia	SD78 Urticaria	US09.00 Renal colic
SD05.01 Pulp space infection of finger/thumb	SD80 Seborrhoeic keratosis	US10 Urethral discharge
SD05.02 Pulp space infection of toe	SD81 Rosacea	US50 Abnormal urine test
SD06 Boil or carbuncle	SD82 Alopecia	US50.00 Orthostatic albuminuria
SD06.00 Furuncle	SD82.00 Alopecia areata	US50.01 Glycosuria
SD06.01 Furunculosis	SD82.01 Androgenic alopecia	US50.02 Proteinuria
SD07 Post-traumatic skin infection	SD99 Other specified or unknown diagnoses and diseases of skin	US90 Concern or fear of disease of urinary system
SD08 Dermatophytosis	SD99.00 Discoid lupus erythematosus	US99 Other specified symptom, complaint and abnormal finding of urinary system
SD08.00 Tinea pedis	SD99.01 Erythema nodosum	
SD09 Pityriasis versicolor	SD99.02 Keloid and hypertrophic scar	UD01 Pyelonephritis or pyelitis
SD10 Onychomycosis	SD99.03 Lichen planus	UD02 Cystitis
SD11 Candidiasis skin	SD99.04 Lichen sclerosus	UD02.00 Acute cystitis (non-veneral)
SD11.00 Candida intertrigo	SD99.05 Onychogryphosis	UD03 Urethritis and urethral syndrome
SD11.01 Candidiasis of nails	SD99.06 Striae atrophicae	UD04 Other specified or unknown urinary infection
SD11.02 Diaper candidiasis	SD99.07 Vitiligo	UD04.00 Urinary tract infection NOS
SD12 Pityriasis rosea		UD25 Malignant neoplasm of kidney
SD13 Scabies and other acariasis		UD26 Malignant neoplasm of bladder
SD13.00 Scabies	<b>Endocrine system</b>	UD27 Other specified and unknown malignant neoplasm urinary tract
SD14 Pediculosis and other skin infestation	TS01 Excessive thirst	UD28 Benign neoplasm of urinary tract
SD14.00 Head lice	TS02 Excessive appetite	UD28.00 Polyp of urine bladder
SD14.01 Pediculosis pubis	TS03 Loss of appetite	UD29 Uncertain or carcinoma in situ neoplasm of urinary system
SD15 Impetigo	TS04 Feeding problem of infant or child	UD35 Injury to urinary tract
SD16 Other specified or unknown skin infection	TS05 Feeding problem of adult	UD35.00 Contusion of kidney
SD16.00 Cellulitis	TS06 Weight gain	UD35.01 Foreign body urinary tract
SD16.01 Erysipelas	TS07 Weight loss	UD55 Congenital anomaly of urinary system
SD16.02 Erythrasma	TS08 Growth delay	UD55.00 Congenital (polycystic) kidney disease
SD16.05 Bacterial folliculitis	TS09 Dehydration	UD65 Glomerular and tubulo-interstitial diseases
SD25 Malignant neoplasm of skin	TS50 Underweight	UD66 Chronic kidney disease
SD25.00 Basal cell carcinoma of skin	TS51 Overweight	UD66.00 Chronic renal insufficiency
SD25.01 Kaposi's sarcoma of skin	TS90 Concern or fear of disease of endocrine, metabolic and nutritional system	UD67 Urinary calculus
SD25.02 Malignant melanoma	TS99 Other specified endocrine, metabolic, nutritional symptoms, complaints, abnormal findings	UD99 Other specified or unknown diagnoses and diseases of urinary tract
SD25.03 Squamous cell carcinoma of skin		UD99.00 Contracted kidney
SD26 Lipoma		UD99.01 Obstructive vesicoureteric reflux
SD27 Benign melanocytic naevus	TD01 Endocrine infection	UD99.02 Urethral stricture
SD28 Haemangioma or lymphangioma	TD25 Malignant neoplasm of thyroid	
SD29 Benign, uncertain or carcinoma in situ neoplasms of skin	TD26 Benign neoplasm of thyroid	<b>Pregnancy and child bearing</b>
SD29.00 Dermatofibroma	TD27 Other endocrine neoplasm	WS01 Suspicion of pregnancy
SD29.01 Dysplastic naevus	TD27.00 Neoplasm of unknown or uncertain behaviour of endocrine system	WS02 Pregnancy vomiting and nausea
SD29.02 Keratoacanthoma	TD27.01 Other benign endocrine neoplasm of endocrine system	WS02.00 Hyperemesis gravidarum
SD29.03 Granuloma telangiectaticum	TD27.02 Other malignant endocrine neoplasm of endocrine system	WS03 Bleeding first 20 weeks of pregnancy
SD35 Bruise or contusion	TD55 Thyroglossal duct or cyst	WS03.00 Bleeding first trimester
SD35.00 Subungual haematoma	TD56 Congenital anomaly of endocrine or metabolic system	WS04 Antepartum haemorrhage
SD35.01 Bruise or contusion of head (excluding face)	TD65 Goitre	WS04.00 Bleeding second/third trimester
SD36 Abrasion, scratch, blister	TD66 Obesity	WS05 Post-partum bleeding
SD36.00 Abrasion, scratch, blister of head (excluding face)	TD68 Hyperthyroidism or thyrotoxicosis	WS06 Breast or lactation symptom or complaint
SD37 Laceration or cut	TD69 Hypothyroidism or myxoedema	WS06.00 Lactation problem
SD37.00 Laceration or cut of head (excluding face)	TD70 Hypoglycaemia	WS39 Other specified post-partum symptom or complaint
SD38 Other specified or unknown skin injury	TD71 Type 1 diabetes mellitus	WS39.00 Abnormal lochia
SD38.00 Avulsion of nail	TD72 Type 2 diabetes mellitus	WS50 Abnormal findings on antenatal screening of mother
SD38.01 Other specified or unknown skin injury of head (excluding face)	TD73 Vitamin deficiency	WS90 Concern or fear of being pregnant
SD39 Insect or spider bite or sting	TD73.00 Vitamin B1 deficiency	WS91 Fear about complications of pregnancy
SD39.00 Tick bite	TD73.01 Vitamin B2 deficiency	WS99 Other specified symptoms, complaints and abnormal findings during pregnancy, delivery and puerperium
SD40 Animal or human bite	TD73.02 Vitamin B6 deficiency	WS99.00 Feeling fewer movements of foetus
SD41 Burn or scald	TD73.03 Vitamin B9 deficiency	WS99.01 Pelvic instability
SD42 Foreign body in skin	TD73.04 Vitamin B12 deficiency	WS99.02 Concern about appearance during pregnancy
SD55 Congenital anomaly of skin	TD73.05 Vitamin D deficiency	
SD55.00 Port-wine stain of skin	TD74 Mineral and nutritional deficiency	WD01 Puerperal infection or sepsis
SD55.01 Strawberry nevus of skin	TD74.00 Kwashiorkor	WD01.00 Infection of perineal wound
SD65 Corn or callosity	TD74.01 Marasmus	WD01.01 Puerperal endometritis
SD66 Solar keratosis or sunburn	TD75 Lipid disorder	WD02 Other specified and unknown infection complicating pregnancy, delivery and puerperium
SD66.00 Actinic keratosis	TD75.00 Hypercholesterolaemia	WD02.00 Genitourinary tract infection in pregnancy
SD66.01 Allergy to sunlight	TD75.01 Hypertriglyceridaemia	WD03 Puerperal mastitis
SD66.02 Idiopathic photodermatitis	TD75.02 Mixed hyperlipidaemia	WD25 Malignant neoplasms related to pregnancy
SD66.03 Photodermatitis	TD75.03 Familial hypercholesterolaemia	WD26 Benign, in situ or uncertain neoplasms related to pregnancy
SD67 Pilonidal cyst or fistula or both	TD99 Other specified or unknown endocrine, metabolic, nutritional diagnoses and diseases	WD35 Injury complicating pregnancy
SD68 Seborrhoeic dermatitis	TD99.00 Addison's disease	WD55 Congenital anomaly complicating pregnancy
SD68.00 Cradle cap	TD99.01 Adrenocortical insufficiency	WD65 Spontaneous abortion
SD69 Atopic eczema, dermatitis	TD99.02 Adrenogenital disorder	WD65.00 Habitual abortion
SD70 Contact or allergic dermatitis	TD99.03 Cushing's syndrome	WD66 Induced abortion
SD70.00 Contact dermatitis	TD99.04 Hyperhomocysteinemia	WD67 Pregnancy
SD70.01 Ingestion dermatitis due to drugs	TD99.05 Lactose intolerance	WD68 Unwanted pregnancy
SD71 Diaper rash	TD99.06 Polycystic ovary syndrome	WD69 Ectopic pregnancy
SD72 Psoriasis	TD99.07 Porphyrria	
SD73 Sweat gland disease	TD99.08 Premature menopause	
SD73.00 Anhidrosis	TD99.09 Pubertatis praecox	
SD73.01 Dyshidrotic eczema	TD99.10 Thyroiditis	
SD73.02 Hidradenitis	TD99.11 Metabolic syndrome	
SD73.03 Miliaria		
SD74 Sebaceous cyst		
SD74.00 Atheroma cyst		
SD74.01 Epithelial cyst		
SD75 Ingrowing nail	<b>Urinary system</b>	
	US01 Dysuria or painful urination or both	
	US02 Urinary frequency or urgency	
	US03 Urine incontinence	
	US03.00 Genuine stress incontinence	
	US03.01 Mixed incontinence	
	US03.02 Urge incontinence	

<p>WD70 Pre-eclampsia or eclampsia  WD70.00 Hemolysis-elevated liver enzymes-low platelet count syndrome  WD70.01 Pregnancy-induced hypertension complicating pregnancy, childbirth or the puerperium  WD70.02 Toxaemia/(pre) eclampsia  WD71 Pregnancy, high risk  WD71.00 Abnormal foetal presentation  WD71.01 Cervical insufficiency/incompetence  WD71.02 Foetal-maternal disproportion  WD71.03 Foetal growth retardation  WD71.04 Pre-existing diabetes mellitus in pregnancy  WD71.05 Pre-existing hypertension in pregnancy  WD71.06 Rhesus antibody present  WD72 Gestational diabetes  WD80 Uncomplicated labour, delivery livebirth  WD81 Uncomplicated labour, delivery stillbirth  WD82 Complicated labour, delivery livebirth  WD82.00 Caesarean section of livebirth  WD82.01 Delivery by vacuum extraction of livebirth  WD82.02 Forceps delivery of livebirth  WD83 Complicated labour, delivery stillbirth  WD83.00 Caesarean section of stillbirth  WD83.01 Delivery by vacuum extraction of stillbirth  WD83.02 Forceps delivery of stillbirth  WD84 Other specified and unknown breast disorder in pregnancy or puerperium  WD84.00 Cracked nipple  WD85 Other specified complications of puerperium  WD85.00 Haemorrhoids in puerperium  WD85.01 Sub-involution of uterus  WD85.02 Venous thrombosis in puerperium  WD99 Other specified and unknown diagnoses and diseases or health conditions in pregnancy, delivery and puerperium  WD99.00 False labour  WD99.01 Prolonged pregnancy  WD99.02 Deep venous thrombosis in pregnancy  WD99.03 Haemorrhoids in pregnancy  WD99.04 Varicose veins in pregnancy</p>	<p>ZC90 Concern or fear of having a social problem  ZC99 Other specified social problems influencing health status  ZC99.00 Discrimination race, religion or gender  ZC99.01 Feeling lonely  ZC99.02 Problem illegal stay  ZC99.03 Problems in recreation and leisure</p>	<p><b>Interventions and Processes</b></p> <ul style="list-style-type: none"> <li>-101 Complete examination or health evaluation</li> <li>-102 Partial examination or health evaluation</li> <li>-103 Sensitivity test</li> <li>-104 Microbiological or immunological test</li> <li>-105 Blood test</li> <li>-106 Urine test</li> <li>-107 Faeces test</li> <li>-108 Histological and exfoliative cytology</li> <li>-109 Other specified laboratory test</li> <li>-110 Specific physical function test</li> <li>-111 Standard mental, cognitive, physical functioning tests and questionnaires</li> <li>-112 Diagnostic endoscopy</li> <li>-113 Diagnostic imaging and radiology <ul style="list-style-type: none"> <li>-113.00 Computed tomography (CT)</li> <li>-113.01 Magnetic resonance imaging (MRI)</li> <li>-113.02 Ultrasound imaging</li> <li>-113.03 X-ray</li> </ul> </li> <li>-114 Electrical tracing</li> <li>-199 Other specified diagnostic interventions</li> <li>-201 Pharmacotherapy and prescription</li> <li>-202 Preventive immunisation and medication</li> <li>-203 Observation, health education, advice and diet</li> <li>-204 Incision, drainage, flushing, aspiration and removal body fluid</li> <li>-205 Excision, removal of tissue, destruction, debridement and cauterisation</li> <li>-206 Instrumentation, catheterisation, intubation and dilation</li> <li>-207 Repair-suture or cast</li> <li>-208 Taping or strapping</li> <li>-209 Application or removal of devices</li> <li>-210 Local injection and infiltration</li> <li>-211 Dressing, pressure, compression and tamponade</li> <li>-212 Therapeutic counselling</li> <li>-215 Delivery related interventions</li> <li>-299 Other specified treatment and therapeutic and preventive interventions</li> <li>-401 Result of test or procedure requested by own provider</li> <li>-402 Result of an examination or test from another provider</li> <li>-501 Encounter or problem initiated by provider</li> <li>-502 Encounter or problem initiated by other than patient or provider</li> <li>-503 Consultation with primary care provider</li> <li>-504 Consultation with specialist</li> <li>-505 Referral to other primary care provider</li> <li>-506 Referral to specialist, clinic or hospital</li> <li>-599 Other specified consultations, referrals and reasons for encounter</li> <li>-601 Administrative procedure <ul style="list-style-type: none"> <li>-601.00 Filling in death certificate</li> <li>-601.01 Prescribing of sick leave note</li> </ul> </li> <li>-602 Formulation of plan for care, management, treatment or intervention</li> </ul>
<p><b>Social Problems</b></p> <p>ZC01 Partner relationship problem  ZC02 Child relationship problem  ZC02.00 Neglected child  ZC03 Parent or family member relationship problem  ZC04 Health care provider relationship problem  ZC09 Other specified relationship problem  ZC09.00 Neighbours quarrel/noise  ZC09.01 Victim of bullying  ZC10 Loss or death of partner problem  ZC10.00 Divorce from partner  ZC10.01 Death of partner  ZC11 Loss or death of child problem  ZC12 Loss or death of parent or family member problem  ZC13 Problems associated with finances  ZC15 Education problem  ZC15.00 Illiteracy  ZC15.01 Failed exams  ZC15.02 Poor educational progress  ZC16 Work problem  ZC16.00 Discord in workplace  ZC16.01 Occupational exposure to toxic agents  ZC16.02 Occupational noise exposure  ZC16.03 Stressful work schedule  ZC16.04 Threat of dismissal  ZC17 Unemployment problem  ZC20 Food or water problem  ZC25 Illness of partner problem  ZC26 Illness of child problem  ZC27 Illness of parents or family member problem  ZC30 Partner's behaviour problem  ZC30.00 Addiction of partner  ZC30.01 Aggressive behaviour of partner  ZC30.02 Infidelity of partner  ZC31 Parent or family behaviour problem  ZC31.00 Addiction of parent or family  ZC31.01 Aggressive behaviour of parent or family  ZC35 Violence problem  ZC35.00 Maltreatment/sexual abuse child  ZC35.01 Physical maltreatment or sexual abuse by partner  ZC35.02 Problems related to assault or rape  ZC36 Housing problem  ZC36.00 Homeless  ZC36.01 Housing unsuited to needs  ZC37 Legal problem  ZC37.00 Imprisonment  ZC37.01 Problems with guardianship  ZC38 Social welfare problem  ZC38.00 Sickness and disability law problem  ZC38.01 Social assistance law problem  ZC39 Health care system related problem  ZC39.00 Person awaiting admission to elderly/nursing home  ZC39.01 Waiting period for investigation and treatment</p>		

<p><b>Functioning (related)</b></p> <p>2F01 Watching  2F02 Listening  2F03 Basic learning  2F04 Focusing attention  2F05 Thinking  2F06 Reading  2F07 Calculating  2F08 Solving problems  2F09 Making decisions  2F10 Undertaking a single task  2F11 Undertaking multiple tasks  2F12 Carrying out daily routine  2F13 Handling stress  2F14 Communicating with - receiving - spoken messages  2F15 Speaking  2F16 Conversing  2F17 Discussing  2F18 Using communication devices and techniques  2F20 Changing basic body position  2F21 Maintaining a body position  2F22 Transferring oneself  2F23 Lifting and carrying object  2F25 Fine hand use  2F26 Hand and arm use  2F27 Walking long distances and short distances  2F28 Climbing (steps)  2F29 Moving around within the home  2F30 Moving around outside the home and other buildings  2F31 Moving around using equipment  2F32 Using transportation  2F33 Driving  2F34 Washing oneself  2F35 Caring for body parts  2F36 Toileting  2F37 Dressing  2F38 Eating  2F39 Drinking  2F40 Looking after one's health  2F45 Doing housework  2F46 Assisting others  2F49 Basic interpersonal interactions  2F50 Complex interpersonal interactions  2F51 Relating with strangers  2F52 Formal relationships  2F53 Informal social relationships  2F54 Family relationships  2F55 Intimate relationships  2F56 Education and school  2F57 Acquiring, keeping and terminating a job  2F58 Remunerative employment  2F59 Non-remunerative employment  2F60 Community life  2F61 Recreation and leisure  2F69 Other specified activities and participation  2F71 Energy level  2F72 Sleep functions  2F73 Attention functions  2F74 Memory functions  2F75 Emotional functions  2F80 Seeing functions  2F81 Hearing functions  2F82 Balance  2F83 Dizziness  2F84 Pain functions  2F85 Exercise tolerance functions  2F86 Sexual functions  2F90 Mobility of joint functions  2F91 Muscle power functions  2F99 Other specified functions</p> <p>2R01 Food  2R02 Drinking water  2R03 Drugs (medication)  2R04 Housing  2R05 Sanitation  2R06 Assistive products and technology for personal indoor and outdoor mobility and transportation  2R07 Natural environment and human-made changes to environment  2R07.00 Indoor air quality  2R07.01 Outdoor air quality  2R07.02 Sound intensity  2R07.03 Sound quality  2R08 Immediate family  2R09 Friends  2R10 Acquaintances, peers, colleagues, neighbours and community members  2R16 Health professionals  2R17 Individual attitudes of immediate family members  2R18 Individual attitudes of health professionals  2R19 Social security  2R20 Health services  2R29 Other specified External Factors</p>	<p>2R30 Extraversion  2R31 Agreeableness  2R32 Conscientiousness  2R33 Psychic stability  2R34 Openness to experience  2R35 Optimism  2R36 Confidence  2R37 Trustworthiness  2R39 Other specified Personality Functions</p>	
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## **D. Use-case: Low-Back Pain**

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### **Consultation 1: Initial Contact**

A 42-year-old man presents to his GP with lower back pain

#### **Reason for Encounter (RfE):**

Discomfort from pain

#### **Subjective (S):**

He describes the pain as a nagging, persistent ache in his lower back. He experiences limitations when sitting or standing for extended periods. The pain has begun two weeks ago and does not radiate. There are no other neurological complaints. It started as an acute back strain after doing some heavy lifting at home for a longer period of time than usual. It has no relationship with his professional activities. His daily activities involve doing administrative office work during the day and playing videogames at night. There are no other associated symptoms, neither bladder nor intestinal symptoms. His sleep quality is reasonable, although the pain is sometimes bothersome. The patient is not feeling particularly ill and has not yet tried anything for the pain. Patient would like some pain relief, is worried about the persistence of the pain and was expecting it to subside in a few days but hasn't

#### **Objective (O):**

- Clear tension in the lower back muscles.
- No neurological deficits.
- Leg muscle strength is intact,
- reflexes are normal
- no sensory disturbance.

#### **Assessment (A):**

Low-back pain

#### **Differential Diagnoses (DD):**

- Muscle Pain
- Chronic widespread pain

#### **Plan (P):**

The doctor decides to prescribe Paracetamol 1000mg every 6h or Ibuprofen 600mg 3x a day or until the pain subsides. Doctor advises to remain active, pay attention to good posture and recommends to do light exercises, like yoga. No sick leave. If the pain does not subside after 2 weeks or gets worse, or if there are neurological symptoms, return for assessment. Warn about stomach-ache and melaena due to the use of NSAIDS.

## **Consultation 2: Worsening symptoms with radiation**

The patient returns after 2 weeks with worsening back pain that now radiates to the left leg.

### **Reason for Encounter (RfE):**

Worsening symptoms with alarm symptom

### **Subjective (S):**

The patient reports that the back pain has become sharper and more severe since the last visit. The pain now radiates to the left leg. He experiences tingling and numbness in the left leg, indicating sensory disturbances. The symptoms significantly interfere with his daily functioning, particularly with his ability to work and to pursue hobbies such as running. His sleep quality is poor due to the persistent pain. The patient is worried that his condition is getting worse. r

### **Objective (O):**

- Positive Lasègue test on the left
- Left kneecap reflex is diminished
- Left drop foot
- Hip flexion test negative
- Antalgic gait
- Restricted ROM back
- Unable to sit or lie down comfortably
- Etc.

### **Assessment (A):**

LEFT sciatic 'nerve root irritation'

### **Differential Diagnoses (DD):**

- Lumbar spinal canal stenosis
- Spondylolisthesis
- Piriformis syndrome
- Hernia with discus prolapse and radiation (radiculopathy)

### **Plan (P):**

The doctor prescribes Paracetamol 1000 mg every 6 hours or Ibuprofen 600 mg three times a day, to be taken until the pain subsides. Doctor advises to limit physical activity for the

time being. Sick leave is given to allow adequate rest and rehabilitation before returning to work.

Patient is referred to a neurologist for further evaluation, due to the persistence of neurological symptoms. An MRI scan of the lumbar spine is ordered. The patient is instructed to return immediately if the pain worsens or if neurological symptoms worsen. Warn about stomach-ache and melaena due to the use of NSAIDS.

### **Consultation 3: follow-up / discussion of results**

The patient returns for a follow-up appointment after being seen by a specialist

#### **Reason for Encounter (RfE):**

Postoperative follow-up

#### **Subjective (S):**

The patient presents for a follow-up consultation to discuss the results received from the specialist. He reports that his symptoms have remained unchanged since the previous visit, with persistent radiating pain and muscle weakness in the left leg. He expresses concern about the ongoing weakness in his left leg and the persistent nature of the pain. The patient would like to understand the possible treatment options and discuss the next steps in his care.

#### **Objective (O):**

- Referral letter from specialist reviewed
- MRI lumbar spine shows disc herniation at L4-L5, causing nerve root compression
- Neurological examination findings consistent with diagnosis

#### **Assessment (A):**

Lumbar disc herniation with radiculopathy at L4-L5

#### **Plan (P):**

The doctor provides education about lumbar disc herniation, explaining the basic pathophysiology and how it can lead to nerve compression and radiating pain. The patient is keen to explore further intervention. Given the MRI findings, the patient is referred to a neurosurgeon for further evaluation and surgical planning.

The patient receives clear instructions for preparation before and after surgery, including guidance on activity restrictions, wound care, and gradual rehabilitation. Several treatment options are discussed, including epidural steroid infiltration, radiofrequency denervation, microdiscectomy, percutaneous discectomy chemonucleolysis, lumbar arthrodesis, and spinal decompression. A short course of Paracetamol 1000 mg every 6 hours or Ibuprofen 600 mg three

times daily is prescribed as needed for pain relief. Sick leave is advised to support rest and recovery before and after surgery.

#### **Consultation 4: Postoperative Recovery and Rehabilitation**

After the surgery, the patient returns for a check-up and discussion of his recovery and rehabilitation.

##### **Reason for Encounter (RfE):**

Planning of the recovery

##### **Subjective (S):**

The patient presents for a follow-up consultation to evaluate his postoperative recovery and discuss ongoing rehabilitation. He reports feeling generally better, although he still experiences some stiffness and mild reduction in mobility after physical exertion. The radiating pain has completely resolved, and he now only experiences mild discomfort localised to the lower back around the surgical site. He mentions that he is currently following a physiotherapy program and has gradually started to return to work.

##### **Objective (O):**

- The scar appears healthy and is healing without complications.
- No neurological abnormalities
- Reflexes are normal
- Range of motion and muscle strength are gradually increasing.

##### **Assessment (A):**

His recovery is progressing well and without complications. Rehabilitation is progressing as expected.

##### **Plan (P):**

The patient is advised to continue with his current physiotherapy program as part of the rehabilitation process. The exercises aim to improve spinal mobility, strengthen the back muscles, and prevent recurrence of symptoms. He is encouraged to gradually increase his return-to-work activities in accordance with his physical progress and tolerance. The patient is instructed to return for assessment if any new complaints arise.

## 12. Annexes

The following is a list of annexes which will be delivered in separate files.

1. ICPC-3 brochure for a lay person
2. ICPC-3 presentation for a lay person
3. SSSOM results file (Excel spreadsheets)
  - a. Combination of SSSOM result files for the SNOClass Whoosh based Search Engine: 2026-01-22-ICPC-3-Whoosh-SE.xlsx
  - b. Combination of SSSOM result files for the evaluation and selection of mappings: 2026-01-22-ICPC\_validation\_LBP.xlsx
4. Notes on the hierarchical matching approach (PowerPoint presentations)
5. List of IBUI/ICPC-2/ICD-10/SCT concepts with ICPC-3 candidates (Excel spreadsheet)
  - a. 2025-12-16-IBUI 3BT SNOMED ICPC3 map exploded sortable.xlsx
6. SNOMED CT Expo presentations
  - a. SNOCLASS: A Belgian terminology project for mapping relevant SNOMED CT concepts to WHO Family of Classifications in 3 domains & Selecting relevant SNOMED CT concepts to consider for mapping to three classifications using hierarchy (semantic) tags - [https://snoclass.be/wp-content/uploads/2025/11/98\\_99\\_snoclass\\_vander.stichele\\_roumier.pdf](https://snoclass.be/wp-content/uploads/2025/11/98_99_snoclass_vander.stichele_roumier.pdf)
  - b. SNOMED CT – ICPC-3 - [https://snoclass.be/wp-content/uploads/2025/10/202589\\_snoclass-icpc3\\_diegoschrans.pdf](https://snoclass.be/wp-content/uploads/2025/10/202589_snoclass-icpc3_diegoschrans.pdf)
7. WONCA World Conference presentation and ePosters
  - a. WICC open day - The Future of ICPC-3 - <https://snoclass.be/wp-content/uploads/2025/10/future-of-icpc-wicc-day-no-video.pdf>
  - b. Mapping SNOMED CT to ICPC-3: sources and strategies - <https://snoclass.be/wp-content/uploads/2025/10/snoclass-wonca-2025-eposter.pdf>
  - c. SNOClass: three coordinated Belgian terminology projects to map SNOMED CT to classifications: Health Interventions (ICHI); Functioning (ICF) and Primary care (ICPC-3) - <https://snoclass.be/wp-content/uploads/2025/10/2025-09-09-general-snoclass-wonca-2025-eposter-v3.pdf>